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NOTICES :—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Dyestuffs Controversy

EVIDENCE is accumulating on every side that the passage of the Government Bill for the protection of certain key industries will not be as smooth as its promoters had assumed. Already the critics are mobilising their forces, and appearances at present point to some vigorous debates on the Government's policy in Parliament. It may be doubted whether the opposition will be strong enough to defeat the measure, though even this is not impossible. What is certain is that the weak points in the ministerial policy will be remorselessly exposed, and that the Government must be prepared to offer reasons of nothing less than national necessity if their Bill is to go through. It must be admitted that "national safety" is a strong argument, and a legitimate one within its proper limits. But a very determined effort will be made to prevent its being exploited in favour of sectional or monopolist interests. If "national safety" be the justification for this frank return to the principle of protection, then it must include the safety of all national industries and not merely one or two. As one contributor to

the discussion puts it, "Whatever we do to protect the dye industry, it is still more important that we should do nothing to damage the textile industry." We have ourselves previously expressed the view that it is not much gain to establish one or two new industries—key industries though they be—if in the process we ruin the industries which safeguard the solvency of the nation.

The issues which have been raised by Mr. Harold Briggs's recent address to the Commercial Committee of the House of Commons are confusing, and it is difficult to see all the interests in their true relation and proportion. One point, we think, is clear. We must for the future be chemically independent of external sources. It sounds rather callous to be already speculating on another war, and it is to be feared that preparations for such a disaster open the way for it by creating a certain atmosphere. On that ground many will sympathise with Professor Soddy's protest against the constitution of a committee to consider chemical warfare and research. Still, we have to choose between disarming altogether and arming thoroughly. There is no middle course. Since the former represents for most nations an ideal not yet attainable, though steadily to be pursued, the latter is the only choice left. Further, if we are to be prepared against war we must be chemically prepared, for chemistry, once debased to destructive ends, will unhappily become a recognised and indeed the paramount military arm.

It has now become almost axiomatic that the chemical plant and processes required for the manufacture of dyestuffs constitute a potential chemical arsenal for war, and that one must possess them in peace in case they may be needed for war. Again, it is a callous doctrine, but the nation seems to have accepted it as inevitable. The fight, we believe, will not be on this first principle. It will be on the particular system or methods chosen for giving effect to it. On this point there is a decided tendency towards a re-opening of the question. The position may now be considered with a far larger experience than was available when the Government chose the existing system. New issues and interests have latterly emerged, and it is openly questioned whether, while the Government's final purpose is accepted as essential, the Government's methods of attaining it are the best that might be chosen. In particular, we may expect a vigorous discussion on the question whether the manufacture of dyestuffs should be restricted to one or two great organisations—partly, like the Church, under State patronage and control—or should be opened up into a really national competitive industry. This cannot be decided now. The interesting point is that, instead of being regarded as finally closed, it will have to be re-opened, together with the collateral question of our trading relations with the dyestuff

makers of other countries. Altogether, the debates on the forthcoming Government measure promise to be of intense interest.

Since the above was written we have received a copy of an important statement made by Mr. Woolcock, M.P., before the House of Commons Commercial Committee in which the matter is discussed from the national point of view.

Neutral Sulphate of Ammonia Output

THERE was a time—not so long ago—when producers of sulphate of ammonia in this country refused to consider seriously the possibility of synthetic sources proving anything in the way of a serious rival. Fortunately, this ostrich-like attitude is no longer so pronounced, and from the point of view of the future welfare of the home producers it is satisfactory to note that consideration is being given to the policies which can be best adopted to deal with the new order of things. It has recently transpired that Germany's synthetic plants are by no means idle. In fact, the position may be gauged from the announcement that she has set aside for export a quantity of nitrogen equivalent to 125,000 tons of sulphate of ammonia, and that of this amount (which is due for delivery between last September and next March) a large proportion has been purchased on behalf of British and Dutch interests acting in concert.

It is interesting to note that the potential output of sulphate of ammonia in the United Kingdom is approximately 450,000 tons per annum from all sources, and while about 270,000 tons was consumed at home during the year before last, last year the consumption fell to 230,000 tons. It is clear, therefore, that there must always remain a considerable surplus for export, and it is, perhaps, mainly the exported material which is affected by the world competition. Germany's resources, of course, stand out above all others, and one learns that whereas her present producing capacity is in the neighbourhood of 1,500,000 tons per annum, she will probably be turning out in the near future the equivalent of 2½ million tons annually. In years gone by the foreign purchaser did not worry himself a great deal about quality, but to-day he is beginning to get very much more insistent. Moreover, Germany is turning out ammonia compounds (such as synthetic urea) which contain no less than 46 per cent. of nitrogen, and possess physical properties of the most desirable nature.

As quality now counts for so much, there is a growing necessity for the home producer to adopt some form of plant which gives a high-testing neutral product. Although a few years ago neutral sulphate was almost unknown in this country, there are now a host of perfected processes for its manufacture; and, while a marked advance is to be recorded, it is still to be noted that only some 30,000 tons per annum (or about 6½ per cent. of the country's potential output) is as yet of an acid-free nature. The situation is, of course, rendered all the more difficult by the fact that there are in this country a large number of comparatively small sulphate producers, and so long as they can continue to dispose of a low-testing acid material at a reasonable price there is little inclination for them to spend money in remodelling their plants. These producers should remember, however, that the farmer has learnt to discriminate between the various grades of sulphate, and

if he cannot obtain that variety which he believes to be chemically and physically the best, he is prepared, in these days of affluence, to pay for a substitute, no matter what the cost may be. In the meantime the situation needs to be taken more seriously in both its commercial and its technical aspects.

Possibilities of Cheap Oxygen

ARE we about to witness the dawn of a cheap oxygen era? Judging from the amount of attention which is being given to the use of oxygen in lieu of air for many chemical and metallurgical processes one can only draw the inference that those who glibly prescribe the use of this gas in large quantities must have some knowledge of impending developments. Some of our readers will remember the controversy which followed the publication of the Nitrogen Committee's report, and the suggestions made therein as to the prevailing cost of oxygen in this country. There was, perhaps, a hint of something approaching profiteering by the oxygen manufacturers, but the latter volunteered a very candid statement on the matter which effectively dispelled any serious apprehension which might have arisen. A cheap supply of oxygen, however, would confer inestimable benefit in many directions where fuel is being consumed or where metallurgical operations are conducted. Ever since the successes of Linde and Claude with air separation, the promise of cheap oxygen has been before us; but in this respect scientific evolution has brought its disappointments, so that to-day we still have to turn on the tap of the oxygen cylinder as though we grudged the use of every cubic foot which is not absolutely essential.

As to the uses of oxygen in bulk many are, no doubt, already familiar with the work of Professor Cobb and Mr. Hodson in connection with the use of this gas in gasification processes, with the promise that the thermal efficiency of such processes which now ranges between 50 and 70 per cent. will be increased to the remarkable figure of 90 per cent. Dr. F. G. Cottrell, on the other hand, has pointed to the economies which will follow in the manufacture of iron and steel when it becomes commercially possible to use an oxygen-enriched air stream in cupolas and furnaces. Apart from the saving of fuel which would be effected, there would follow the almost more important effect of curtailing the quantity of impurities—particularly sulphur—carried into the metal from the fuel. Moreover, the use of oxygen would permit of the employment of a host of low-grade fuels which are now unusable, thus assisting in the conservation of our available fuel resources. A serious problem which arises in connection with the treatment of sulphide ores is the sulphurous nature of the effluent gases discharged into the air. Here again oxygen would certainly prove a palliative; and, with the higher sulphur concentration which would follow, it should be possible to devise a method whereby the sulphur was recovered and turned to profitable account.

At the moment, however, it would seem that our own lack of certain natural resources is likely to preclude us from taking any great part in the solution of the problem; for abundant water power is almost surely the *sine qua non* of cheap oxygen, and we must probably rest content to let development proceed in such countries as Canada, Norway, and Switzerland.

Recognising the Trader

WE have more than once of late emphasised the important part the merchant plays in the development of British industries, and the detrimental effect on trade that may follow the policy, apparently favoured in some quarters, of trying to eliminate him. Three incidents recorded this week suggest that these views are steadily gaining support. In the first place, several important chambers of commerce, including Birmingham and Glasgow, have definitely decided in favour of the inclusion of merchants in British Industries Fairs and of their organisation as a distinct section. The Chemical and Dyestuff traders have already laid a comprehensive statement of the merchants' claims before the Committee who are considering the matter, and their case will be appreciably strengthened by the attitude of the chambers of commerce.

Secondly, Mr. Percy Ashley, the head of the chemicals and dyestuffs department of the Board of Trade, in a careful and interesting speech the other day on industry in Birmingham, indicated the need for a closer understanding between manufacturers, merchants, and the various Government departments. There has been a suspicion that the official attitude has rather favoured the practice of direct dealing between manufacturers and consumers. There is nothing in Mr. Ashley's speech to support this view. His argument is all in favour of friendly and co-operative action between all the parties to British industry, and in his responsible position at the Board of Trade Mr. Ashley has opportunities of exercising effective influence in this direction. If he succeeds in doing this, it will be a service of real value.

Lastly there is the interesting announcement that in connection with stocks of reparation dyestuffs in this country the Board of Trade desires to dispose of them directly to or through the recognised trading channels, and the invitation to dyestuffs merchants who are interested to communicate with the Industries and Manufactures Department of the Board of Trade. The Board is to be congratulated on a step which will be distinctly appreciated by traders because it recognises them as the proper distributive medium. The further statement that these stocks have not hitherto been put on the market out of consideration for the condition of the trade shows a regard for the difficulties of business firms which will not be overlooked. Altogether it would seem that the trader interest, as the result of recent activities on its behalf, is gradually recovering the recognition which is its due.

The Future of Finsbury College

OLD students of Finsbury Technical College—and they are numerous and distinguished—will read with interest the account given on another page of the present position of the College. It appears that the institution will cease to exist in July next unless in the meantime measures are taken to ensure its continuance. Naturally such an end to a College which has done so much useful work is contemplated with deep regret by old students, and a movement has been started to avert it. In a sense, it may be true that Finsbury has outlived its usefulness. At a time when universities were fewer, and a university training was more expensive and less acces-

sible than it is to-day, such half-way houses as Finsbury Technical College were of great educational and technological value. They met needs that must otherwise have remained unsatisfied, and many chemists in particular have reason to be grateful to it. But, as we have said, it may have served its purpose, and if continued at all may have to be continued in a new form. This point, we believe, has not been overlooked. It may be that work will yet be found for it, possibly as a research school for industrial chemistry or in some similar capacity, and that the necessary funds may be provided by a group of manufacturers for the purposes of collective industrial research. The idea is attractive, and it would preserve both the titular and the educational associations of the College, and old students would be honestly thankful for the institution's escape from extinction.

Unknown

THESE words are being written on Armistice Day, when one of the rarest and most beautiful tributes ever paid to the memory of the honoured dead is being offered in the capital of the Empire. The burial in the Abbey of the Unknown Warrior who fell in the service of his country is at once a symbol and a sacrament—appealing to and uniting the nation as nothing else could have done. The beauty and simplicity of the idea are unspeakably more impressive than any pageant could have been, and they sort perfectly with the severe reserve with which the British people pass through their greatest experiences. Words could only vulgarise such an occasion, but we feel our readers would wish us to offer to the memory of all the fallen this brief acknowledgment in their name.

The Calendar

Nov. 16	Sheffield Association of Metallurgists and Metallurgical Chemists : "Cold Working of Steel," by G. Glenn.	Royal Victoria Hotel, Assembly Room, Sheffield.
16	Society of Chemical Industry Edinburgh Section.	Edinburgh.
16	Institution of Petroleum Technologists : "Colloidal Fuel," by L. W. Bates ; "Properties and Characteristics of Colloidal Fuel," by Sir F. W. Black. 5.30 p.m.	John St., Adelphi, London.
16	Royal Colonial Institute : "Petroleum Resources of the British Empire," by George Howell.	Hotel Victoria, Northumberland Avenue, London.
16	Hull Chemical and Engineering Society : "Lubrication," by T. A. Nightscales. 7.30 p.m.	The Metropole, West Street, Hull.
17-18	Leather Trade Conference : "Recent Research in Leather Chemistry," by Professor Proctor. 10.30 p.m.	Leathersellers' Hall, St. Helen's Place, London.
18	Chemical Society : Informal Meeting. 8 p.m.	Burlington House, Piccadilly, London.
18	Manchester Municipal College of Technology (Dept. of Applied Chemistry) : "The Handling of Liquids in Chemical Works," by J. H. West. 6.30 p.m.	Manchester.
19	Chemical Industry Club : Second Annual Dinner : Sir William Jackson Pope, chairman.	Connaught Rooms, London.

Dyestuffs Manufacture and the Textile Industry

Position Reviewed by Mr. W. J. U. Woolcock, M.P.

Last week considerable interest was aroused in a statement by Mr. Harold Briggs, M.P., on the relation of the dyestuffs industry to the textile trade, before the House of Commons Commercial Committee. The other side of the question is now presented in a comprehensive review before the same committee by Mr. W. J. U. Woolcock, M.P., general manager of the Association of British Chemical Manufacturers.

Speaking at the adjourned discussion of this subject at the House of Commons Commercial Committee, Mr. W. J. U. Woolcock, C.B.E., M.P., said that the outstanding feature which was bound to strike any careful inquirer who attempted to review the history of the dye industry in this country was that the industry had never had a fair chance of development. To undertake such a task at any time would be difficult, but to attempt it in the middle of a war when the production of explosives, poison gases, and other essential materials had turned dye works into chemical arsenals was an almost super-human task. Moreover, the industry was handicapped from the commencement by the fact that the extent of the problem was never fully realised. It was thought to be a question of making dyes; it was infinitely more than that; long before it became a matter of producing the colour, intermediates had to be made, and further back still, adequate supplies of raw materials for the making of the intermediates had to be assured, and again, markets had to be found for the by-products. The problem was, in fact, comparable with that of producing munitions during the war, but whereas in that case every firm in the country which could produce anything to help was given its quota of work to be done, in the dye problem all the eggs were placed in one nest, and they must not be surprised if the resulting brood was neither so numerous nor so fine as was hoped.

A Perilous Position

It was an astounding fact that there was no attempt made at any co-operative effort in which manufacturers of heavy chemicals, of fine chemicals, of tar products, and of explosives were induced to play their part. All this was impressed on the Government by the Association of British Chemical Manufacturers more than two years ago, but the result had not been proportional to the effort then made, and if the House of Commons did not insist on the problem being dealt with immediately, the country might find itself in a perilous condition. The language he had used might seem strong, but he used it deliberately.

Why might the position become perilous? If they failed to establish a dye industry in this country, why were they any worse off than if we fail to establish, or lose any other already established, industry?

The answer, Mr. Woolcock said, is that the national safety of the country is to-day dependent on its chemical industry, and will become more and more so as chemical science is increasingly used in modern warfare, and in everyday life, particularly in relation to agriculture. The loss of two million pounds' worth of trade in dyes per annum is not in itself a sufficient reason for special treatment of the industry; it is the loss which follows from this which is so serious. If we lose or fail to develop our dye industry we lose the very plant and machinery on which we shall have to depend if another war is thrust upon us. We shall also have failed to train the particular kind of chemist on whose brains we shall have to rely in the next emergency.

The Textile Industry

On the top of all this there is the danger of the ultimate destruction of our great textile industry. I trust you will allow me to develop this point because I fear that in too many minds the general impression has been made that all textile makers want free imports of German dyes and all dyemakers want the total prohibition of imports of German dyes. This is a generalisation which is dangerous. There are textile makers who now the war is over are anxious for the free importation of German dyes. Their desires are not based on any particular economic doctrine and their point of view is well worth considering. It is usually expressed in this way: "The value of our textile industry is one hundred times as great as that of the dye industry. To hinder in any way the free import of German dyestuffs is to kill the textile industry. It is foolish to throw away 200 millions of textile business for

the sake of 2 millions of dye business." This argument, left at that point, is sufficient for those whose outlook is limited or the verbiage of whose political decalogue is of more importance than the realities of life. Why should we trouble to establish a dye industry in this country when Germany can sell us all the dyes the textile industry wants? If you suggest in reply that if there were no British Dye Industry perhaps Germany might cease to supply them with dyes or might supply them at a price which would make it impossible for them to compete in the world's markets, you are told with an air of finality that we had no dye industry before the war, and Germany never withheld or charged high prices for her dyes! Thus we under-rate the intelligence of our competitors and wilfully shut our eyes to the psychology of the German industrialists.

Anyone who believes that Germany kept our textile industry going before the war, or will continue to do so after the war, for any other reason than that she is not yet ready to do otherwise, entirely fails to appreciate the German commercial brain. We never have sufficiently understood what I call the Duisberg mind, nor his wonderful creation, the Interessen Gemeinschaft. Hence, I say, that the position might become perilous for the nation, and especially dangerous to the textile industry, if we do not establish the manufacture of dyes in this country.

Remedies

If I carry you with me in my contention that it is essential for the safety of the nation that we should have a dye industry in this country, and that, let it be noted, in the interest of textile manufacturers as much as of everybody else, then let us consider the methods whereby this can be brought about. Two things are essential: (1) that the Government should take a wider view of their responsibilities and encourage the co-operation of all who can assist. I will not enlarge on this point to-night. (2) That the Government should at once (next year will be too late) introduce a Bill granting some assistance to the industry for a few years. Now the question is "What form shall this assistance take?" This problem has engaged the attention of those best fitted to solve it for many months. My personal view is that every possible form of protection is bad, but that some assistance is necessary; and I, therefore, approach the problem with the idea of finding the least objectionable form in which assistance can be given. There are five different ways in which it might be done; let us examine them for a moment.

1—Tariff

This has only to be stated to be rejected at once. The absurdity of the amount necessary to allow for the difference in the rate of exchange alone kills this method with ridicule.

2—Subsidy

Most Government subsidies have been withdrawn, and the enervating effect of subsidies is too well known to admit of their being granted on a large scale in the case of the dye industry.

3—State Purchase and Sale Bureau

The essence of this method is that it should be made compulsory that both the purchase and sale of imported dyes should be made through a Central Bureau in which the Government should be interested together with men of commercial and technical knowledge. This method overcomes some of the difficulties inherent in other proposals, but introduces additional difficulties of its own. It would necessitate the setting up of a special and rather expensive organisation. This is to be deplored, but what really kills the idea is that we have not at the moment the experts, who would have to be independent of any particular firm, and who would be required to staff the Bureau.

4—Licensing Plus a Tariff Fee

The idea here is that an importer should be able to obtain a licence as of right (thereby eliminating the uncertainty of the

ordinary system of licensing), but that he should be charged a subscription fee, which would vary with each article, and which would be based on the difference in price between the foreign-made article and that of British manufacture. The chief attraction of this method is the removal of the uncertainty whether a licence will be granted or not. In effect it is an easily varied tariff under another name. It has all the disadvantages of an ordinary tariff, and one more. I cannot imagine the House of Commons entrusting any body of persons other than itself with the right to fix and vary a tariff.

5—Licensing

Mr. Briggs has quoted Lord Emmott as saying that he knew from his experience in the War Trade Department that it was impossible to conduct a licensing system fairly. I do not know whether Lord Emmott is correctly reported, but if so it is rather a sweeping statement to make. One might say for example that a licensing system had not been fairly conducted, but to say that it is impossible to conduct it fairly is to make a statement which I for one with the greatest respect beg leave to doubt. As recently carried out it sometimes results in delays, and is apt to be irritating to the importer and user, but it does not entail some of the disadvantages which are common to other forms of protection. It is in fact the least objectionable of all the forms of assistance which can be given to the dye industry, and if re-introduced with one essential modification, would, I think, meet the case. Let us bear clearly in mind what is the object we have in view. It is not to prohibit the import of foreign dyes merely because they are foreign or to enable British manufacturers to carry on their business without fear of competition. It is to encourage them to spend money on plant and on research work and then to assist them to so co-operate that in a short time they can stand alone and fight their own battles. I therefore suggest that you cannot do better than adopt a system of prohibition except under licence, with this important modification that it is understood that licences, for any particular dye which is needed should be freely granted as of right, unless and until the British manufacturer has shown cause why the particular dye should not be admitted in unrestricted quantities. In this way you stimulate efficiency in a way which bounties and subsidies will never do.



Russia's Chemical Industries

(From a Correspondent)

THE Russian Division of the U.S.A. Bureau of Commerce has just issued a report on possible developments in Russia's chemical industries, based on information obtained from the *Narodnoe Khoziaistvo* for May, 1918. As the country was then in some of the worst stages of the revolution, it was hardly possible that a report on one of its greatest industries could be of any great value; but in view of the high standard of American Government trade reports which has hitherto prevailed, it is a little surprising to find the Commerce Bureau issuing a document of such crudity and vagueness as this.

In one section it is stated that potash was among the principal articles exported by Russia before the war, whilst in another it is pointed out that Russia has very little potassium, although some beds were recently discovered in Perm, but have not yet been exploited. The pre-war exports must have been re-exports of German material; but this is not definitely mentioned. In 1913 5,000,000 poods (1,000 poods = 16 tons) of potash were imported into Russia. We also learn that acids, alkali and salts are largely by-products (!) and that the "production and consumption of these will depend upon the demand for these products by other branches of industry"; and, further, "the only chemical products Russia exported prior to the war were turpentine, tar and potash; but she exported semi-manufactured articles which required for their preparation acids, alkali and salts." We presume that in this illuminating statement the term "chemical product" means raw (or unmanufactured) material, and that manufactured or semi-manufactured goods are not "chemical products." It is also interesting to learn that, before the war, about 300,000,000 poods of cast iron were produced, together with approximately the same quantity of coke, but the "catching" of "ammonium gas" was practised by only a few factories. From the number of times that Berthollet's salts are referred to one would imagine that the manufacture of these constituted one of the chief chemical industries of Russia.

Among the industries which may rise to importance in the future are (1) production of Berthollet's salts; (2) artificial coal and graphite—whatever these may be; (3) "metal aluminium"; (4) "metal magnesium," "metallic sodium" and phosphorus. It would be interesting to know the precise reason for introducing "metal" or "metallic" here, and what is the exact difference between Al, metal Al and metallic Al or Na. But what is "artificial coal"?

The report says that the most important item in Russia's chemical industry is artificial fertiliser, the following table showing imports and production in 1913 and 1916:

	1913.	1916.
Phosphates—		
Produced	(poods) 11,200,000	... 3,500,000
Imported	,, 23,200,000	... —
Nitrates—		
Produced	,, —	... 300,000
Imported	,, 3,000,000	... —
Potassium compounds—		
Imported	,, 5,000,000	... —

It will be noted that 300,000 poods of nitrate were "produced" in 1916. An effort has, in fact, been made to establish a factory for the manufacture of nitrate from the air near the Kivach waterfall on the river Suna, Olonetz Government, where 25,000 H.P. is available, and an annual output of 400,000 poods of nitric acid is anticipated. Some further figures are given concerning the possible production of nitrate and the power available from waterfalls and from peat bogs; but these are necessarily very vague. Doubtless if Russia's agriculture were placed on a thoroughly scientific footing, including an adequate appreciation of the use of artificial fertiliser, the demand for such fertiliser in Russia would be immense; but there is at present very little prospect of agriculture in that country being so placed. Some hypothetical figures are given of possible consumption of fertiliser, but these again are very indefinite.

A noteworthy feature in Russia's agriculture is the cultivation of oilseed crops, especially linseed and sunflower seed, and a large extension of these on scientific lines would be of very great value to the world generally and to Russia in particular in view of the growing importance and indeed vital need of oils and fats. Concerning this important section of Russia's chemical industry on the organic side, the report before us merely observes, "The operation of the factories for the treatment of fats (soap, candles, glycerin, &c.) will be delayed by the shortage of fats. It can readily be realised that the betterment of agriculture and stock-raising, and the expansion of seal hunting, will greatly aid the development of this industry." It is doubtful if the former great oils and soap industries in Russia can hope for much help from a problematical extension of seal-hunting. The rubber factories are said to have been well developed technically before the war, and "if they retain their former position they will produce a surplus for exportation."

"The importation of dyes, photographic and pharmaceutical goods will continue after the war. It can be expected, however, that the production of these commodities will begin in Altai, in the Kuznetsk region, and in the Donetz basin, for the reason that by-products obtained from reducing coal into coke are available in those places. . . . Even the most simple dyes which might be produced in Altai will find a ready market in the textile factories which will, no doubt, be established in the Semipalatinsk region, and in the middle Asian possessions for producing cotton, woollen and silk goods. The textile factories of Moscow and Petrograd will continue to import dyestuffs."

It is further intimated that the factories for the dry distillation of wood, which were formerly small peasant establishments, will do business on a larger scale. The products—turpentine, tar, acetone and acetic acid—are needed for home consumption, but there may be an increasing amount available for export. The whole of the match production is consumed at home, but owing to the cheapness of wood it is possible that the match industry will expand and there will be matches for export "when the production of Berthollet's salts and phosphorus is developed." The naphtha factories will produce, as before the war, large quantities of lighting and lubricating materials for export. It is suggested that the powder and explosive factories might reduce their output of these commodities to one-fourth and turn to the production of superphosphates, for Russia has enormous beds of phosphate, although of not very high quality.

High Speed Electric Telpherage

By Herbert Blyth, A.M.Inst.C.E., A.M.I.M.E.

THE fourth in the series of lectures upon chemical Engineering at the Manchester College of Technology, was one on "High-Speed Electric Telpherage," delivered by Mr. Herbert Blyth, A.M.Inst.C.E., A.M.I.M.E. (Strachan & Henshaw, Ltd., Bristol), on Thursday evening, November 4, to a large and interested audience.

Mr. Blyth said that the problem to be considered was the vexed question of increased output, which was agitating the minds of all leaders of industry and organisers of labour. Increased output largely depended upon the methods adopted for handling materials. It was, therefore, apparent that the means adopted and the cost of handling bore a very definite relation to the output cost and the speed at which a commodity was produced. There were other matters besides machinery to be considered in dealing with the question of production and handling, and one of the greatest of these, to those who had any natural feeling about them, was the problem of the human point of view. It served very little useful purpose to install an elaborate machine if the men operating it had no sympathy with it.

Therefore, taking the subject of production as a whole, with which the question of handling was intimately bound, other fundamentals had to be brought into consideration—namely (1) co-operation of effort upon the part of those at the factory and others; (2) transport; (3) conditions under which work was carried on; and (4) the question of conservation of energy. When one visited gasworks, chemical works, spelter works, ironworks, &c., an enormous waste of human energy was often painfully apparent, and materials were handled in a most laborious fashion; instead of getting the best out of a man he was simply made tired by making him do unnecessary work. It was not difficult to imagine the cause of some of the industrial discontent which existed, and which frequently led to unreasonableness of mind, and, in the end, to the putting forward of excessive demands upon the part of the workmen. If a workman entertained the suspicion that a machine was going to do him out of a job they could readily understand that he would maintain a hostile attitude towards its use. The desirable object to attain was to place appliances at the disposal of the worker which would enable him to increase his production tenfold with the expenditure of merely an ordinary amount of energy, and with a due reflection of the result in the amount of his earnings.

Problems in Chemical Works

In tackling problems in chemical works one was often confronted by very serious obstacles, some of which were:—

1. The difficult nature of the material to be handled.
2. The awkward, somewhat tortuous, route over which the material had to be carried.
3. Existing structural difficulties—i.e., having proposed some scheme of improvement the necessary alterations to existing structure was sometimes a formidable question.
4. The question of maintenance and depreciation of machinery in a chemical works was a matter which required special consideration in view of the corrosive conditions obtaining in such works.

Some very important developments in electric telpherage in recent years had caused a good many engineers, and others concerned with handling problems, to take an increasing interest in the subject, and at the present time a large number of extensive telpher plants were to be seen in all parts of the country, except, oddly enough, in chemical works. The material usually met with in chemical works was frequently of a nasty and dangerous character to handle. The problem therefore was to devise machinery which could convey it from point to point rapidly and efficiently and with the minimum of discomfort and expense to all concerned. Frequently the route over which the materials could be conveyed was not a straight path, owing to the fact that many chemical works were of old design and construction. There were all sorts of corners and levels to be dealt with, and, in addition, there were obstructions in the form of existing buildings, the alteration, or the doing away with, of which would involve considerable expense. In the latter case the problem of

transport had frequently to be solved by going overhead. Telpherage had not received the attention it deserved from the chemical engineers of this country, and, to his great regret, he must repeat "the old, old story," that for really good examples of the telpherage system on a general scale in chemical works they must look to Germany.

Principles of the Telpher System

The term "telpher" was simply a combination of two Greek words ("tele" from a distance, and "phero" to carry), and was adopted by Dr. Fleeming Jenkin some 40 years ago to represent his system of conveying, and the first example of the plant was erected at Weston, in Hertfordshire. This installation was about 700 ft. long, and carried about 1 ton weight. It was worked upon an automatic principle, and the attendant did not travel with it. Telpherage was not put upon a commercial footing in this country until 1903, there thus being a serious loss of time for such a useful invention to be brought to the notice of engineers.

Mr. Blyth then described a telpherage plant installed by Siemens Bros. in 1903 at Pease's West Colliery, Crook, near Durham, the track upon which the machine ran being a steel cable of about 1½ in. diameter. There was no hoisting gear carried, the machine being simply a conveyor, the power being fed to it in the ordinary way like a tramline by overhead wires. It was, therefore, a "straight-line" job, and its function was to carry small coal to a bricking plant.

A similar plant installed about the same time, at the Cape Copper Company's Works, in the neighbourhood of Swansea, was also illustrated on the screen.

It was not possible to make a cable negotiate a curve in a thoroughly satisfactory manner, and in order to overcome the difficulty the introduction of a solid piece of rolled joist became necessary.

It was very important with rope telpher tracks to keep the tension of the rope constant. If the rope was definitely anchored at each end it would be possible to overload it. Some balancing arrangement was necessary, the usual form being simply that of a weight suspended over a pit and an ordinary rope drum, the tackle being similar to that for suspending the hook block from an ordinary overhead crane. It would be seen that the weight rises or falls as the load carried on the rope was increased or decreased. At the present day such a rope would be rather costly, it being of special "locked coil" construction. However, for light loads under some circumstances the cable track has the advantage that long spans can be adopted.

A plant put up at Larders & Nucoline's works at Silvertown for the oil-cake business was erected partly over water, the cable principle being quite useless in such a case. The whole thing had to be cantilevered over from the wharf. Three or four extensions of the plant had been made since its initial installation, and it had now been adopted practically all over the works.

One of the advantages of telpherage, as indicated by this illustration, was the use of switches and branch tracks in any direction. Although it was not feasible to make a track go round any number of "S" bends, yet it was quite possible to negotiate a curve of 7 ft. 6 in. radius or less.

Construction over Rivers

An interesting type of plant described was that installed for Clarke, Nichols & Coombes, confectionery manufacturers, Victoria Park, London. It was partly constructed over the river, having about 100 ft. spans. There was, of course, no rope in this case, but a steel joist was used for the track. The structure had to be in the nature of a bridge, passing over the river and adjacent buildings. This was effected by the use of deep box girders. Telpherage being really a single-rail system, it was necessary to keep the top flange absolutely free for running, and therefore it was essential to hand the track by connecting to the web, leaving the flanges free.

Installations at Gasworks

Telpherage in due course became a subject of great interest to gas engineers. The first plant was installed at Newport,

and from the illustration shown it appeared to resemble a forest of supports. It was designed for the conveyance of red hot coke, which was about one of the worst things that could be handled, particularly when incandescent. In the case of later illustrations elsewhere, where there was more head room, it was possible to take the telpher right into the retort house. The carriage of red-hot coke, as well as many chemicals, on an ordinary conveyor was not desirable; such material should be carried in bulk. In the telpherage scheme a series of skips was put in front of the retorts, the coke was pushed out into them by the charging machine, which was on the other side of the retort benches. The telpher came along and picked up the strips in rotation, and the red-hot coke was thus conveyed outside the house and lowered into quenching tanks. Afterwards taken to the screening plant, the coke being ultimately delivered into trucks and the breeze diverted to a convenient dump or into other trucks.

Transporters and Telphers

An illustration was then shown of the wheel carriage of an ordinary transporter, in the better known form, running on the bottom flange. To hold up such a track all the bolts were in tension. It was well known to engineers that it was not good practice to put bolts or rivets in tension; they should be in shear. Another disadvantage shown by the illustration was that the bearings were very small, and that overhanging pins had to be used for the wheel axles, while the wear and tear on wheels and track was excessive. These were some of the reasons why the bottom flange transporter system did not make progress, and made way for that of the mono-rail telpher. In the case of the telpher, all the bolts were in shear, and there was plenty of space above the track beam for axles and bearings of ample proportions. Instead of having two flanges or paths to run upon (which led to a slipping in rounding curves), there was practically a single line contact. The facility in rounding curves was much greater and the running much sweeter, and there was no limitation as to the bearings, which could be as long as desired, the general practice being to have roller bearings about 2 in. diameter, 5 in. long. Such a wheeled carriage would last for two or three years without replacement if it was filled up at the start with vaseline and made dust proof.

A Modern Telpher

A modern telpher could be used for any kind of work operating either with grab or skip. The important point was that in going over a tortuous route the device should be perfectly flexible. The bogies at the top must be quite free. It was possible for the carriages to swivel to almost any extent. In the case of a gas works or chemical works, where there were objectionable fumes, or where the telpher was running in the open air a good deal, it was necessary to provide adequate protection for the man in charge by means of a suitable box or cab arrangement, from which he could observe his load in any position. One of the first coal plants that was installed on the telpher system was at Exeter, and was erected at a height of 50 ft. above ground. There was very little room to get the stanchions down, and difficulty was experienced in supporting the girders, which had to be in long spans of about 95 to 100 ft. The plant was erected in 1909, and was still working satisfactorily, the wear and tear on the carriage wheels, bearings, &c., having been practically negligible for the first few years, and, in fact, were only just about to be renewed.

When handling coal, coke and other materials it was very often necessary to weigh them, and the Telpher system was one which gave the best facilities for weighing materials in transit. There was a loose piece of track over the top of which was placed an ordinary automatic weighing-machine, and by means of which a perfect record of the net load was obtained. There was no conveyor system which offered such opportunities for weighing as the Telpher.

Barging Operations

In another illustration coal had to be brought from barges and taken some 300 or 400 feet into bunkers across the river. The Port of London would not allow permanent structures to overhang the river, and therefore a crane had to be employed in this case. The coal was dropped by the crane into a hopper weigher, and was weighed in about 10 or 15 seconds and then automatically discharged into the bunkers. The plant was installed for the purpose of dealing with 40 tons per hour, and it had often dealt with 70 tons per hour.

Switch Lines

The whole problem of switch lines was now absolutely solved, and there was no danger of the Telpher inadvertently running through an open switch. The switches could be operated either from the ground or by the man in the cab, if necessary. Owing to developments in this direction it was now quite possible to deal with very important problems in regard to the conveyance of all classes of materials under almost any conditions.

Mr. Blyth then gave details of the arrangement of travelling Telpher bridges, the general arrangements of runway and Telpher track, girders, and a special type of Telpher track with an extraordinarily long span, such a plant being installed over ships' berths at Palmer's Yard, Jarrow-on-Tyne.

Conclusion

To sum up the scope and limitations of telpherage, the first point was that the Telpher while being a conveyor was also an elevator. It could also pick up and drop its load at any desired point. The man in charge could be practically on top of his load all the time. In Germany some arrangements were entirely automatic, the attendant being in a kind of signal cabin and conducting the various operations by pressing electric buttons. This, of course, necessitated the employment of an attendant with considerable technical skill and knowledge to keep the plant in working order. There was also a semi-automatic method with a distant control in which it was not necessary to have a man in the box; it was simply a matter of wiring. It could not, however, be used at a great distance away by suitable signals. An important point was the relationship between the fixed structure and the machinery with respect to depreciation. 12½ per cent. was a safe allowance to make for the depreciation of a machine, while with structure 2½ per cent. to 3 per cent. was sufficient. In the case of a Telpher plant the relationship between machinery and structure was about 1 to 4. This was a very important point, and probably more would have to be said about the "machinery to structure ratio" in the future. One disadvantage of a conveyor was that it had to be loaded at a given point, and although weighing in transit could be done by conveyors, the results were not very satisfactory, and, to conclude, the Telpher, within its legitimate sphere of operation, could go anywhere and handle practically anything.

Chemical Industry Club

New Sub-Committees for the Year

At the first meeting of the new executive committee of the Chemical Industry Club on Monday evening, Dr. W. R. E. Hodgkinson was unanimously re-elected chairman, and cordial acknowledgment was made of the valuable services he had previously rendered in that capacity. The following sub-committees were elected for the year:—

FINANCE.—Mr. A. G. Craig, Dr. F. B. Dehn, Lieut.-Col. W. Cullen and Dr. Wilbraham.

SELECTION.—Mr. E. T. Brewis, Mr. R. B. Pilcher and Mr. A. J. Chapman.

ENTERTAINMENTS.—Dr. Ormandy, Mr. B. F. Davis, Mr. W. Graham, Mr. F. E. Hamer and Lieut.-Col. Cullen.

GENERAL ADVISORY.—Sir William Pope, Dr. Ormandy and Mr. F. E. Hamer.

Mr. J. D. Fry has severed his connection with Bristol University. Mr. Fry is a lecturer in Physics, and last summer was appointed chief physicist to the British Rubber Tyre Research Association. With Professor Chattock, he designed the standard gauge used in all aeronautical research stations and he is well known as a designer of sensitive pressure gauges.

Receptacles in which a poisonous substance is sold must, by Order in Council, be of sufficient strength to withstand rough usage and be free from leakage. This is one of the steps taken by the authorities owing to outbreaks of poisoning having occurred through contamination of sugar by arsenic from leakage of such substances as weed-killer when being conveyed in the same truck.

Society of Chemical Industry

Manchester Section

PAPERS were read before the Manchester Section of the Society of Chemical Industry on November 5 by Messrs. S. J. Peachy and A. Skipsey on a "New Process for the Vulcanisation of Rubber," and Capt. F. S. Sinnatt, Mr. A. Grounds, and Mr. F. Bayley on "The Inorganic Constituents of Lancashire Coals."

Vulcanisation of Rubber

Messrs. Peachy and Skipsey gave an account of the recently discovered process for vulcanising rubber by subjecting the material to the action of certain gases.

Vulcanisation, which was one of the most important of the various operations comprised in the manufacture of rubber goods, had hitherto been effected either by the "hot cure," in which the rubber was intimately mixed with sulphur and subjected to prolonged heating, or by the "cold cure," which consisted in treating the rubber with a weak solution of chloride of sulphur at the ordinary temperatures. The former process was by far the more widely used, the "cold cure" being limited in its application by the fact that the vulcanisation which it brought about was purely superficial. Both of these processes suffered from certain drawbacks, the chief being the serious restriction which they imposed upon the manufacturer in his choice of filling and colouring agents. Organic fillers, such as leather, cork and wool wastes, wood meal and the like would not resist the combined action of heat and sulphur, or the action of sulphide chloride without undergoing serious deterioration, and the same was true of the great majority of coal-tar dyestuffs. The manufacturer had, therefore, to confine himself almost exclusively to the use of inorganic compounding agents and mineral pigments, with the result that a number of valuable technical and artistic effects were unobtainable.

The new process of "curing" consisted in treating the rubber alternatively with each of two gases, viz., sulphur dioxide and hydrogen sulphide. These gases were separately absorbed by the rubber, and, interacting therein, produced a highly active (probably atomic) form of sulphur which combined directly with the rubber, bringing about effective vulcanisation. The process being a cold one, and also obviating the use of sulphur chloride, rendered possible the use of a large variety of organic filling and colouring agents most of which were unaffected by exposure to the gases named.

Technically, the process was of immediate importance in that rubber could be used as a binding agent for materials such as cork dust and wood meal, the mixings after being sheeted and vulcanised forming a cheap and excellent material for floor covering. Leather waste could similarly be converted into a re-formed leather suitable for the boot and shoe and for the upholstery trades. Shoddy waste yielded a felt-like material which should find many uses.

The new process was applicable also to the vulcanisation of dissolved rubber, and the use of the gas-vulcanised solution yielded excellent results when applied in repair work.

A prolonged discussion followed, in which Messrs. Allan, Grounds, Bailey, Tomkinson, Marcroft, Sahai, Leon, Bloch, Wollaston and Terry took part.

Mr. E. V. Evans, general treasurer of the Society of Chemical Industry, proposed, and Mr. Leon seconded, a vote of thanks to the authors for their paper.

Inorganic Constituents of Lancashire Coals

In their paper on the above subject, Capt. F. S. Sinnatt, Mr. A. Grounds and Mr. F. Bayley examined the white partings (ankerites) occurring in a number of typical Lancashire coals, and compared the results with the chemical composition of the ash of the coal. Their investigation showed that these white partings, or ankerites, consisted of calcium carbonate, in which the base was replaced by varying proportions of magnesium, iron (ferrous) and manganese. The highest percentage of ferrous carbonate found up to the present was about 30 per cent., and the highest manganese carbonate content was 1.8 per cent. A knowledge of the composition of these substances was of importance, as owing to the iron being in the ferrous condition, oxidation of the compounds was possible. The fact that certain of the compounds contained manganese suggested that this element might act as a catalyst for the oxidation of the ankertes of the coal substance with which it

was in contact. It was, therefore, possible that the oxidation of these compounds might have some distinct influence upon the primary oxidation of the coal substance. A number of determinations of the carbon dioxide evolved when coal was treated with mineral acids were quoted, and it was shown that the percentage of carbon dioxide found in coal could not be accounted for entirely by the proportion of bases present in the inorganic constituents of the coal.

Preliminary experiments were also quoted indicating that the iron found in coal existed largely in two forms, viz., in the form of iron pyrites, and the remainder wholly in the ferrous condition.

The authors discussed briefly the possible influence of their observations upon the storage, the fusibility of the ash and the heating of the coal in the goat in coal mines.

A discussion followed in which the following members took part: Messrs. Allan, Terry, Thomson, Evans, Stevenson, McCulloch, Hanney, Booth, Grounds, Bloch, Taylor and Varley.

Professor Green proposed, and Dr. Dunningham seconded, a vote of thanks to the authors.

Yorkshire Section

The first meeting of the winter session of the Yorkshire Section of the Society of Chemical Industry was held at the Queen's Hotel, Leeds, on Monday last, November 8. There was a large attendance present, and Dr. Lloyd, of Bradford, presided in the absence, through illness, of Mr. S. H. Davies (chairman of the section).

A paper jointly written by Messrs. J. Haworth and J. Evans (both of Sheffield) on the active streams in the valleys of the Don and Loxley, was read by Mr. Haworth.

The paper explained that ochre waters were waters in which salts of iron occurred in solution, and said that these were a matter of great inconvenience in areas where there were coal measures or where mining operations were carried on to factories which used river water for industrial purposes.

Ochre waters were always found where mining operations were carried on, and, if not treated, they caused corrosion of boilers, tanks, pipes and similar plant. The discharge of them could not be controlled in any way or purification insisted upon, as waters drained from mines were specifically excluded from control by river authorities under the various Rivers Pollution Prevention Acts. The only remedy was to soften them and neutralise their action before use.

New Zealand Imports

H.M. TRADE COMMISSIONER'S Report on the trade of New Zealand, dated July, 1920 (Cmnd. 1008), gives the following details: Imports of oils, fats, and waxes from the United Kingdom amounted to, competitive, £6,510 in 1918, and £18,413 in 1919; non-competitive, £4,584 in 1918, and £4,562 in 1919; totals for 1918, £11,094, and £22,975 for 1919. Imports of paints and varnishes, competitive, 1918, £39,876, 1919 £88,183; non-competitive, nil for both years. Drugs, chemicals and druggists' wares, competitive, 1918 £409,337, 1919 £484,977; non-competitive 1918 £6,451, 1919 £3,399; totals, 1918 £415,788, 1919 £488,376. Manures, competitive, 1918 £74, 1919 £14,848; non-competitive, 1918 £46, 1919 nil.

Toronto Trade Commissioner in London

MR. F. W. FIELD, H.M. Trade Commissioner at Toronto, who has recently arrived in this country, is at present at the Department of Overseas Trade interviewing firms in London who are desirous of obtaining information as to the possibilities of extending their trade in Canada, and who wish to take this opportunity of consulting him on any matters connected with their business with that country. London firms who are desirous of consulting Mr. Field should communicate with the Department of Overseas Trade, 35, Old Queen Street, S.W.1. He will subsequently visit some of the leading industrial centres.

It is reported from Spain that big chemical fertilizer contracts are going to the Berlin Kali Syndikat, and that enormous benefits will be derived by the agriculturists of that country owing to the low prices at which the transactions are being booked.

Finsbury Technical College

To be Closed next July unless Funds are Provided

INQUIRIES among those interested in chemical education and technical training, especially among old students, reveal a decided feeling against the closing of Finsbury Technical College, which must take place next July, unless, in the meantime, funds are secured for carrying on its work. Finsbury is one of the most important centres of technical, particularly chemical, training in the country, and many chemists now holding high positions in the profession have passed through its courses. If the efforts which are now being made to save the college fail, the discontinuance of such an institution will be widely regretted, both on sentimental and on educational grounds. It is true that industrial and technological chemistry engages the attention of the universities to a larger extent to-day than ever before, but it is difficult to see what can adequately occupy the place that Finsbury has hitherto filled. Until this lack is made good, there must remain in many quarters a strong opinion against the closing down of this familiar and valuable institution.

A large number of our readers are old Finsbury students, and know a good deal about the history and constitution of the college; but it may not be generally known that it is in no way supported by the Board of Education, the London County Council or other Government funds.

Constitution and Dependency

The City and Guilds of London Institute was founded in 1878, incorporated under the Companies Act in 1880, and received the grant of a Royal Charter in 1900. It is an association of the Corporation and Livery Companies of the City of London, instituted "for the purpose of all such branches of Science and Fine Arts as benefit, or are of use to, or may benefit or be of use to, productive and technical industries, especially, and to commerce and industry, generally, or any branch thereof, and for the utilisation of such means as will promote the several exclusive purposes aforesaid." The management of the Institute and its branches is vested in the members' council and executive committee, composed of representatives appointed by the Corporation and the following Livery Companies of London contributing to its funds—namely, the Mercers', Grocers', Fishmongers', Goldsmiths', Skinners', Merchant Taylors', Salters', Ironmongers', Vintners', Clothworkers', Dyers', Leathersellers', Pewterers', Cutlers', Tallow Chandlers', Armourers' and Brasiers', Saddlers', Cordwainers', and Plasterers', and of certain ex-officio members, including the President of the Chemical Society. Unfortunately, these Guilds or Companies are not as wealthy as they were at one time, and it has been found necessary to curtail expenditure. More unfortunate still is the fact that economic measures have threatened the closing of one of the most important of their institutions.

Formation of Defence Committee

Past and present students and others interested in the college have met together and formed a Defence Committee. The work of this committee is to consider the possibility of helping in any way to carry on the work of the college, and thus obviate its closing in July, 1921. Invitation has been thrown open to all who wish to support the movement by becoming members. (Application, with entrance fee (2s. 6d.), should be sent to Dr. Atkinson, at the College, Leonard Street, E.C.2.) The Defence Committee is closely considering which line of action is best calculated to achieve the purpose which it has in view—namely, to preserve the educational activities of the college under the direction of the City and Guilds of London Institute.

School of Industrial Chemistry

On July 9 a statement was issued by the Council of the City and Guilds of London Institute which clearly indicated that the Institute had been advised that if the college were to devote the whole of its energy to industrial chemistry it would enter upon a new career of usefulness. But, of course, chemistry is not the only faculty of the college, and if the advice is acted upon it will mean that the civil, mechanical and electrical engineering departments will have to go. In other words, the whole institution will have to be reorganised upon an entirely new basis, with chemistry as its *ad hoc* faculty. This would not be as disastrous as it might appear at first, for in the statement referred to above the Council said: "The

institute is advised that it is the policy of the London County Council to make the Northampton Polytechnic (which has been established within a mile of Finsbury College) a thoroughly good engineering school, that it is at least questionable whether there is need in such close proximity for two engineering colleges, both attempting to cover the same ground, and that the engineering school at Finsbury should be discontinued."

It appears that there is a danger that in closing the engineering departments there would arise "great disadvantages" as well as largely increased expenditure in carrying on the college as suggested for the development of industrial chemistry. The Council contend that the local educational authority is the authority that has now been charged by Parliament with the duty of providing for the "progressive development and comprehensive organisation of education" in London.

Mr. Percy Ashley on Industry

Makers' and Traders' Relations with Government Departments

MR. PERCY ASHLEY, assistant secretary in charge of the Industries and Manufactures Department of the Board of Trade, speaking on some functions of the State in relation to industry at Birmingham this week, remarked that the critical attitude of manufacturers and traders towards Government Departments was largely the outcome of that very extensive system of departmental control which had developed during the past few years. It was only natural, he said, there should be that feeling, and he sympathised with it very strongly. He could say the last thing the Board of Trade desired was to maintain control over the operations of manufacturers and traders except in those very special cases in which its retention was essential because of some great national interest. But, broadly speaking, what they were anxious to see was the removal of control in all directions as rapidly as possible.

Mistakes of the Past

If they looked at the general condition of British trade and industries before the war they would see they showed great vitality, and very considerable power of expansion; but there were certain conditions and circumstances which indicated, notwithstanding, that all was not well. Certain branches of production, of great importance as the bases for other manufactures, had come to be entirely in foreign, and, in a number of cases, potentially enemy control. In some branches of industry, outside staple trades, foreign competition had become increasingly acute, and some of the great staple trades themselves were being threatened with severe competition. That condition of affairs was due to a variety of causes, and he ventured to think one of the most important of these was the influence of tradition. The long start which British industries and trade had enjoyed, the great achievements of our manufacturers and traders in the past, had engendered a feeling of confidence in the continuance of the position which had been established. There seemed to be an inadequate recognition of the necessity for constant vigilance and for constant effort to meet the changed conditions of world trade. There were, of course, numerous trade organisations of one kind or another, but there was little common action among them except on the question of price regulation. Manufacturers and merchants kept the Government departments, not unnaturally, at arm's length. The Government departments, on the other side, in view of the general condition of public opinion were reluctant to launch out into action of the "promoting" kind, and were content in the main to limit themselves to the regulative functions which were imposed upon them from time to time by Act of Parliament.

In view of the new conditions which this country had to face, and of the competition which would come again from great organisations in foreign countries, the essential thing for British industries, added Mr. Ashley, was co-operation—co-operation between those engaged in any particular branch of trade and industry, between employers and employed, and between manufacturers and traders and Government Departments. He was not one who thought that a Government department could tell the manufacturers and merchants of this country how to carry on their business, but he did think there were times when a department, properly equipped and organised, could do useful work in directing the attention of people in particular trades to weaknesses in our industrial position.

Chemical Matters in Parliament

Dye-Making Industry

THE Prime Minister, replying to Mr. Doyle (House of Commons, November 4), said he was aware of the position in respect of the dye-making industry in general and the British Dyestuffs Corporation in particular, and of pledges given thereto on behalf of the Government. A Bill dealing with key industries would be introduced as soon as possible, but it would be inadvisable to limit such a bill to the dye-making industry alone.

Natalite

Natalite has been referred to several times lately. Mr. Chamberlain, questioned by Mr. Jesson (House of Commons, November 4), said that it was necessary, both for the protection of the Revenue, having regard to the high rates of duty on spirits at present in force in this country, and in fairness to home manufacturers, that all spirits intended to be used as motor fuel should be denatured here under the supervision of the Revenue officers. The importation duty free of natalite, or any other spirit denatured abroad, would involve risks to the Revenue which, as at present advised, he was not prepared to take.

Metal and Chemical Bank

In answer to Mr. W. Shaw (House of Commons, November 4), who asked whether the Government had any financial interest in a concern called the Metal and Chemical Bank, controlled by a Mr. Tilder Smith, and whether any preferential treatment was given to enable this institution to import flax into this country, Sir P. Lloyd-Greame said that the answer to the first part of the question was in the negative. As regards the second, the bank had received in its negotiations with the Governments of the Baltic States such diplomatic support as would be accorded in similar circumstances to any British concern of good standing.

German Dyestuffs

Mr. Shaw asked the President of the Board of Trade whether he was aware that French textile manufacturers were, and had long been, receiving large quantities of German dyes, and if we were receiving an adequate proportion of the German output of dyestuffs. Sir R. Horne replied (House of Commons, Nov. 8) that he had no reason to suppose that the French consumers of dyestuffs had been placed in an unduly favourable position, as compared with British consumers, in respect of supplies from Germany, or to doubt the adequacy of the supplies being received from that country by way of reparation and otherwise. In reply to Mr. Doyle he said that he was aware that a certain proportion of the exports of German dyestuffs was through Belgium and Holland, and it might be assumed for practical purposes that the whole of the exports of dyestuffs consigned to the United Kingdom from these two countries was of German origin. The total quantity of synthetic dyestuffs and intermediate products imported into the United Kingdom from Holland, Belgium and Germany in the first nine months of the year was 2,986 tons. A small proportion of the dyestuffs consigned from Switzerland to this country was also probably of German origin, but it was not possible to form any reliable estimate of the amount. Of the amount referred to, 877 tons was in respect of reparation supplies from Germany.

Chemicals and Colours

Asked by Sir W. Barton whether he would consider the advisability of setting up a committee or commission to investigate the whole question of internal production and supply of chemicals and colours and as to what extent we are still dependent on outside supplies for the finer colours and chemicals necessary for our export trade in textiles, Sir P. Lloyd-Greame (House of Commons, Nov. 9), said that the essential facts of the situation were, he thought, sufficiently well known to H.M. Government and the trades concerned, and he did not think that any useful purpose would be served at the present stage by setting up such a body as was suggested.

Power Alcohol

Sir R. Horne said, in reply to Mr. W. Thorn (House of Commons, Nov. 8), that his attention had been drawn to the resolution. The Fuel Research Board had for a considerable time past been making investigations and experiments in the

production of alternative supplies of motor fuel, including power alcohol. Their interim report issued in July last gave the results of those inquiries up to that time. The research work was being continued.

Anglo-Persian Oil Co.

Replying to Mr. Macquister (House of Commons, Nov. 8), Mr. Chamberlain said that the special interests of H.M. Government in the Anglo-Persian Oil Company were protected by the *ex-officio* directors on the board. He had confidence in the judgment of the board of directors, including the *ex-officio* directors, as to the commercial transactions of the company and in accordance with the assurance given to the company at its formation. He did not propose to intervene in the ordinary commercial management of the company. He was satisfied that the money voted by Parliament had been all applied to the purposes for which it was voted. The object of the Government participation was to secure adequate supplies to this country, and particularly for the Navy. That was a matter of general policy which the Government would seek to protect, but he did not propose to intervene, and indeed, the Government of the day gave the assurance when the company was formed that we would not intervene, in the ordinary commercial management of the company.

Aluminium Welding Patents

On Tuesday, in the Court of Appeal, the Master of the Rolls, and Lords Justices Warrington and Younger, reserved judgment in the appeal by the defendants, the London Aluminium Co., Ltd., from a judgment of Mr. Justice Sargent, sitting in the Chancery Division, in favour of the Aktiengesellschaft fur Autogene Aluminium Schaveissung, who were the plaintiffs in the action. The plaintiffs in the Court below brought an action against the defendants, the London Aluminium Co., Ltd., for infringing plaintiffs' patents for improvements in the welding of aluminium. Mr. J. Hunter Gray, K.C., argued the case for the appellants, and Sir Arthur Colefax, K.C., for the respondents, the plaintiffs in the action in the Chancery Division. The legal arguments lasted several days.

Voluntary Liquidation

R. LANE HALL & CO., LTD., 1, Steward Street, E., chemical merchants.—In pursuance of the provisions of the Companies' (Consolidation) Act, a largely attended meeting of the creditors of the above was held on November 10, at the offices of Henry Portlock & Co., 186, Bishopsgate, E.C. The company had previously passed resolutions in favour of voluntary liquidation, and had appointed Mr. F. Portlock and Mr. J. D. Pattullo to act as joint liquidators.

Mr. Pattullo stated that the affairs of the company were somewhat complicated. It was a private company with a nominal capital of £5,000. The two vendors, Mr. David Misel and Mr. R. Lane Hall were each allotted 1,000 shares as fully-paid as part consideration for the assets they transferred. The two vendors were the directors of the company. Subsequently Mr. Lane Hall joined the army, went to France, and was posted missing, and it was presumed that he had been killed. The books were in a chaotic condition, and had not been completely written up, while the balance-sheets were overdue. The balance-sheet for 1917 was only completed during the last few months, while the figures for 1918 had just been finished. The resolution for voluntary liquidation was passed on October 22. There were ranking liabilities of £9,708, in addition fully secured creditors for £318, and bank £984. The latter held life policies which more than covered their claim. Assets were estimated to realise £912, or a deficiency of £8,796.

Mr. Pattullo had received a letter from a relative of one of the directors, who stated that if the voluntary liquidation with the present liquidators was continued a sum of £900 would be provided for distribution amongst the creditors. It was decided on the motion of the representative of the British Dyestuffs Corporation seconded by Mr. R. Moyle to confirm the voluntary liquidation of the company with the present liquidators, while a committee of four of the principal creditors were nominated. It was stated that the claims of the four principal creditors aggregated rather more than £7,000.

National Association of Industrial Chemists

Newcastle and District Branch

At a meeting of the above branch in the Church Institute, Newcastle-on-Tyne, on Saturday, a paper was read on "The Development of the Chemist in the Iron and Steel Trade and the Need for Organisation," by Mr. W. Hargest, who has been in the iron and steel trade for many years. The first part of the paper was chiefly taken up by tracing the changes in the iron and steel trade due to the introduction of the Siemen-Martin, the Bessemer and the Basic processes. Mr. Hargest pointed out how, in each succeeding development of the industry the chemist had become more and more necessary to the technical and commercial success of iron and steel undertakings. The chemist had practically displaced the old sample-passers. In passing, he paid a tribute to the efficiency of the older sample-passers who attained such excellent results merely by the judgment of experience and without chemical knowledge. The increasing necessity for exact knowledge on the composition of iron and steel, ores and coal, had, however, brought large numbers of chemists into the industry. The foundry had also provided a field for the chemist and it was largely due to his work that castings were so successfully made at the first casting. The chemist was useful not only to the seller of iron and steel, but the buyer had also found the advantage of having men who could check the material supplied, and thus industry as a whole was being put on a sounder footing by the work of the chemist.

Whilst it was true that the value of a chemist was recognised by employers, it was remarkable how slowly the same employers recognised their liabilities towards the chemist. Prior to the almost general employment of chemists by works the employers were forced to pay very large sums to public analysts for work now done by their own staffs. He could remember when the wages of a whole laboratory staff could have been paid by a £5 note—the chief included : at the best, in those days, the chemist was looked upon as a necessary evil. He himself had been told when asking for £1 that a chemist could be got to replace him for 15s. The industrial chemist, however, industrious in his work was very apathetic with regard to his own conditions. He was content to hide his light under a bushel, while the engineer took the credit, though the chemist solved many of his problems for him. The public had never realised the value of the chemist until the war, and employers generally had only a hazy idea of a chemist's knowledge.

Trade Unions and Professional Workers

Mr. Hargest pointed out how the ideas of trade unionism were spreading far beyond the manual workers to the professional classes, including chemists. The N.A.I.C. was the only organisation out for the betterment of the working members of the profession. They were out for efficiency in the laboratory and sought by legitimate means the proper status of the chemist in the industrial world. They were not in any way antagonistic to the employers, but they did want the employers to recognise the fact that without the chemists in modern industry they would be seriously handicapped. All they asked for was a living wage and a little more for recreation or study. The skilled artizan after serving his time had no need to trouble any further, but the chemist had to be always studying to keep up to date. Books to him were as necessary as tools to the joiner. The wages of the chemist had improved during the past five years through the pressure of large organisations which brought pressure to bear on the employers, but as a profession they should be able to get that improvement by their own efforts. The employers should observe that the tendency was for chemists to join large organisations like the Steel Smelters and others. He deplored the overlapping of the existing societies in the chemical industry. He did not approve of chemists joining other large trade organisations, as they had questions to settle which the layman could not possibly understand. Federation was feasible, he thought, but the profession should be kept quite distinct. He believed that if the average chemist were not so apathetic and joined the N.A.I.C. they would soon raise the status and improve the conditions of the industrial chemist.

Fertilisers and Missing Warranty

At Hull, on November 5, Ald. John Grindell, J.P., fertiliser merchant, &c., of Bromley Street, Hull, and Hornsea, was summoned for failing, without reasonable excuse, to give an invoice respecting a consignment of superphosphate of lime delivered to the Humber Fish Manure Co., Ltd., Storeferry, Hull, for use as a fertiliser, stating the name of the article, and showing the respective percentages (if any) of nitrogen, soluble phosphates, insoluble phosphates and potash.

The proceedings were taken at the instance of the Town Clerk, who was represented by Mr. H. Hopkins, and Mr. T. W. Holdich defended.

Mr. HOPKINS said the summons was taken out under the Fertilisers and Foodstuffs Act, 1906, which provided that any person who sold for use as a fertiliser of the soil any article subjected to any artificial process in the United Kingdom, or imported from abroad, must give an invoice showing the percentage of nitrogen, soluble phosphates, insoluble phosphates and potash, after, before, or as soon after as possible, the delivery of the article in question. The reason was to enable the purchaser of a fertiliser to know exactly what he was buying. The Humber Fish Manure Co., through the agency of Mr. Thomas, managing director, and Mr. John Grindell, who was in business in Bromley Street, Hull, as a seller of fertilisers and agricultural necessities, entered into an arrangement which led to these proceedings. Defendant agreed to let the Humber Fish Manure Co., have 10 tons of superphosphate of lime, and stated positively to Mr. Thomas that it contained 36 per cent. of phosphates. It was, he thought, an admitted fact by people in the trade, both merchants and scientists, that the only figures ever mentioned in connection with these fertilisers related to the amount of soluble phosphates. A fertiliser contained a large proportion of insoluble phosphates, which were comparatively of no value. It was the soluble phosphates alone that determined the selling price. When scientists and merchants were discussing fertilisers they only discussed soluble phosphates, and never discussed insoluble phosphates. Two tons of this manure were ordered, and immediately used, on the understanding that it was 36 per cent. soluble phosphates.

Inspector Finds Deficiency

Some of the fertiliser made from the manure was delivered in Herefordshire, where a sample of it was taken by an inspector, examined and found to be deficient. Since that the Humber Fish Manure Co. had had to explain the circumstances to the Ministry of Agriculture. If the defendant had delivered an invoice showing this stuff to be 36 per cent. soluble phosphates, he would have been liable to prosecution for a false warranty. On February 23, 4 tons more of this superphosphate of lime were delivered, and Mr. Thomas, having had his suspicions aroused by the Herefordshire incident, had a further conversation with the defendant, who again affirmed it was 36 per cent. soluble phosphates. A letter confirming this, which had not been denied by the defendant, was written by Mr. Thomas. In the course of correspondence with the Ministry of Agriculture they had referred him to a case in the *Law Journal* of 1911, in which Lord Alverston, the Lord Chief Justice, stated that it was difficult to see why an analysis should be required if the offence was a failure to give an invoice. In order to conform with the requirements of the Ministry of Agriculture, however, he produced their consent to this prosecution, and an analysis showing that this superphosphate of lime contained only 31 per cent. of soluble phosphates and not 36 as alleged. There they had, he submitted, the whole motive for not delivering the invoice. Letters were written to the defendant with the sole idea of getting an invoice. Subsequently, not an invoice, but a statement of account was received, showing a sum of £46. 10s. due to the defendant in respect of this manure, whereas according to what was originally agreed upon, for 36 per cent. soluble phosphate, the amount should have been £51. 9s. It was evident defendant had realised he had not delivered what he had contracted to sell, and delivered that statement instead of an invoice. Mr. Thomas admitted in cross-examination by Mr. Holdich, that after delivery a letter was received from Mr. Grindell, who explained that in the statements he had made he was relying on a certificate he had showing the total contents of phosphates, and not merely relating to soluble phosphates.

The magistrates adjourned the case until November 19.

Society of Public Analysts

Abstracts of Papers

ON Wednesday, November 3, an ordinary meeting of the Society of Public Analysts was held at the Chemical Society's rooms, with Mr. Alfred Smetham in the chair.

Part of the proceedings was the reading for the first time of certificates in favour of Messrs. Urbay Aspey, Herbert Corner Reynard, B.Sc. (Lond.), A.I.C., Edwin Burnhope Hughes, B.Sc. (Lond.), A.I.C., Harry Jephcott, M.Sc. (Lond.), A.I.C., and Arnold Lees, A.I.C. A certificate was also read a second time in favour of Mr. T. K. Chose, B.A. Mr. Udalpus Aylmer Coates was elected a member of the Society.

Estimation of Bismuth as Phosphate

"The Gravimetric Estimation of Bismuth as Phosphate and its Application in Ore Analysis" was the title of a paper by Dr. W. R. Schoeller and Mr. E. F. Waterhouse, which was read. In the paper a modification of the method for the gravimetric estimation of bismuth as phosphate was described, the directions being sufficiently explicit to render the method easily applicable even if the operator had only an occasional determination to make. A process for the determination of bismuth in ores was also described in detail. In this the lead was removed by iron wire; copper, arsenic and antimony by extraction of the sulphides with sodium cyanide and sulphide, and the bismuth converted into and weighed as phosphate. The authors endorsed Moser's opinion of the phosphate method—*i.e.*, that in the great majority of cases it should prove the most advantageous method, and be accorded first place in the text-books.

Time Factor in Saponification

In his paper on the above subject, Mr. Percival J. Fryer, F.I.C., said that determinations were made of the rate of saponification under certain specific conditions of temperature, solvent and concentration of alkali of various oils belonging to the different classes of oils and fats, with a view to ascertaining if such differences in rate were sufficiently great to form the basis of an analytical method for identifying individual oils and fats.

On Collecting Water Samples

A paper was read on "Apparatus for Collecting Samples of Water at Great Depths," by Mr. W. T. Burgess, F.I.C. The device, he said, was supported by a single wire, and the sample was collected in a stout glass vacuum tube protected by a cylindrical casing, through which the water can pass freely. When at the required depth, the upper end of the exhausted tube was broken by the motion of a plunger operated by a falling weight. The apparatus was suitable for taking samples from very deep wells or borings of small diameter.

Advertising of Companies' Winding-up Petitions

IN the Chancery Division of the High Court on Tuesday, Mr. Justice Lawrence stated that before the list of winding-up petitions was called he wished to draw attention to the fact that there was a growing tendency among practitioners in presenting winding-up petitions to disregard the rules applying to the advertisement of petitions. In that day's list there was hardly one petition in which the rules had not been disregarded in one respect or another. He warned practitioners that the rules must be strictly complied with, or he would be reluctantly compelled to direct petitions to stand over to be properly advertised, which would involve the cost of the adjournment of the petition.

Compulsory winding-up orders in the usual form were made against Lysle Export and Import Co., Ltd., and other companies.

Appointment of Trustee

AN adjourned meeting of the creditors of Samuel Diamant, chemical merchant, 51, Castellain Mansions, Elgin Avenue, W., was held on Tuesday at the London Bankruptcy Court, when a resolution was passed for the appointment of Mr. J. B. Wandless, of 13, Old Jewry Chambers, E.C., as trustee of the debtor's estate. The bond to be given by the trustee as security was fixed at £300.

Chemical Warfare

Universities and Scientific Workers

In a letter to *Nature* Professor Frederick Soddy deals at length with the Committee now being constituted for chemical warfare and research. The Committee's work, he states, is governed, as regards disclosures, by the terms of the Official Secrets Act, and every member of the Committee will be required to sign a statement that he has read the Act and is prepared to abide by its provisions. It is the intention to allocate, so far as practicable, research of a purely scientific nature in chemical warfare to universities and similar outside institutions.

This, he writes, is a very important matter which ought not to be left entirely to the personal choice of individuals, but should be most carefully considered by the universities and by scientific workers as corporate bodies. It was one thing for scientific men and the universities to be called upon in the stress of actual conflict to assist the fighting Services when they were forced by enemy action to protect themselves against, and in turn to develop, a mode of warfare until then proscribed by civilised nations, but it is surely quite another matter for them, in consequence, to be called upon without consultation to become a normal part of the peace organisation for developing it in secret, both in its offensive and defensive aspects, to the utmost possible extent. Personally, I feel that universities and scientific men stand for something in the world higher than anything which has as yet found expression and representation in Governments, particularly in their international relations. In consequence, I fear that they will find themselves in a false position if they allow themselves by default to be depressed to the position of mere agents to develop this new and, as yet, still unlegalised mode of warfare. My own individual view is against accepting this invitation until the question of the position of the universities and scientific men as corporate bodies, in the part of the organisation which they are not invited to join, has first been satisfactorily settled.

Dye Soap Case

RIVAL claims for the registration of the word Aladdin, with respect to soap, were heard in the Chancery Division on Wednesday by Mr. Justice Sargent, on an application by the Aladdin Products Co., of Chicago, that the register of trade marks should be rectified by the removal of the trade mark Aladdin registered in Class 47 by the respondents, Messrs. James Crean & Son, Ltd., soap manufacturers, of Liverpool. Mr. Kerby, K.C., appeared for the applicants and Mr. Hunter Gray, K.C., for the respondents.

Mr. Kerby explained that the applicant company who were manufacturers of dye soap, had branches in Canada, France and England. They applied for the registration of the word Aladdin in the miscellaneous class and were told it ought to be in the soap class, but when they desired to transfer it to that class they were told that the word was already registered for ordinary soap under the name of James Crean. The applicants persisted in their application on the ground that their soap, being a dyeing soap, was different from the ordinary variety, but they were refused registration. They then appealed to the Board of Trade, but the matter stood over because of facts they ascertained about the Crean trade mark Aladdin. Counsel said that the applicants had made inquiries in the trade and were unable to find any Aladdin soap on the market.

Arthur Thomas Long, manager of the applicants' English company, gave evidence to the effect that the average early output of the American company was 75,000 gross. The soap was intended to dye articles of wearing apparel, such as flannel and since January when they began their sale in this country had been about 5,000 gross.

On behalf of respondents, it was stated that their Aladdin soap was manufactured solely for co-operative societies.

At this stage there was a consultation between the parties and Mr. Kerby announced that they had come to arrangement which was provisional upon a joint application to register both of the marks, respondent's being limited by excluding dye soaps and applicants' to dye soaps only. If they were unable to carry the registration through, they would be at liberty to resume those proceedings from that point.

His Lordship assented.

Chemical Combine in America

THE Commercial Counsellor to H.M. Embassy at Washington (Mr. J. Joyce Broderick) states that the new corporation in America, consisting of five large chemical companies, will be known as the Allied Chemical & Dye Corporation. The capital stock will consist of 65,000 shares of 7 per cent. cumulative preferred stock of \$100 par value and 3,000,000 shares of common stock without par value. In announcing their approval of the plans, the stockholders' committee stated that if current earnings should be substantially maintained, as is expected, and if half of such earnings in excess of preferred dividend requirements should be distributed in regular quarterly cash dividends on the common stock of the new company, holders of such stock may expect to receive regular quarterly dividends thereon at the rate of \$6 per share per annum. From the economic point of view, there is less interest in the plan to unite corporations with capital approaching the immense sum of \$275,000,000 or \$300,000,000 than in the industrial results aimed at by combination. According to the New York *Times Annalist*, the Barrett Company stands as one of the largest producers of roofing and paving materials, and a leader in the preparation of various coal-tar products with 40 plants devoted to the work. The General Chemical Company turns out miscellaneous chemicals. The National Aniline and Chemical Company, a combination of concerns making dyes and dyestuffs from coal tar, has the largest aniline plant in the United States, and carries the production of colours through from base to finished material. The Semet-Solvay Company produces steel, iron, coke, lumber, gas, oils, chemicals, &c., and engages in construction work. The Solvay Process Company, while primarily devoted to the preparation of alkaline products, has turned a great deal of its attention in recent years to the operation of by-product coke ovens, and both this company and the Somet-Solvay Company stand in a favoured position in the production of benzol and other chemicals derived in the making of coke through contracts with the Solvay Collieries Company. The last-named corporation owns more than 10,000 acres of coal lands in West Virginia and Kentucky, with a productive capacity of nearly 1,750,000 tons of coal annually.

Levinstein's Suit against Du Pont

OUR New York contemporary, *Drug & Chemical Markets*, states that Judge Morton and a jury are hearing the evidence presented in the United States District Court by Edgar Levinstein in his suit against E. I. du Pont de Nemours & Co., who claims that the Du Pont Company failed to deliver certain types of dyes under a contract which was made with him by E. I. du Pont de Nemours & Co. Levinstein claims \$1,000,000 damages for breach of contract.

It is stated in the complaint that the du Pont Company in 1916 bought of Levinstein, Ltd., of Manchester, England, the exclusive right to manufacture and sell the Levinstein dyes in America, with the agreement that Edgar Levinstein, who had for many years been the sole representative of Levinstein, Ltd., in the United States, with headquarters in Boston, should be continued as a selling medium for these dyes. The du Pont Company agreed to reserve for Edgar Levinstein an annual supply of Levinstein dyes and also du Pont dyes on which, it is alleged, he was guaranteed a profit.

Edgar Levinstein claims that the du Pont Company solicited his customers to transfer their trade in dyes to the du Font Company, thereby violating their contract.

German Reparation Dyestuffs for Sale

THE Chemical and Dyestuff Traders' Association in a circular to the members announces that the Board of Trade hold considerable stocks of German reparation and other dyestuffs which have not hitherto been put on the market out of consideration for the condition of the trade. The Government, it is stated, are anxious to dispose of these stocks, which cover a wide range of colours, direct to the trade, and firms interested are invited to communicate direct with the Industries and Manufacturers' Department, of the Board of Trade, Great George Street, S.W.

October Trade Returns

Decrease in Both Imports and Exports

IMPORTS for the month of October were the lowest recorded for any month this year. A decrease of £2,803,000 is shown as compared with the previous month, and the total is £3,611,000 less than for the corresponding month last year. To what extent the labour situation last month influenced these figures it is difficult to determine. High prices were probably an adverse element in the situation, and may have accounted very largely for the decline, especially with regard to imports of raw materials. Altogether the imports for the month were valued at £149,889,227.

With regard to exports, which in value amounted to £112,295,474, an increase of £33,234,329 above the corresponding figure for October, 1919, occurred, although as compared with September this year a decline, considerable but not general, is recorded. The aggregate value of exports compared with September shows a decrease of £5,160,000.

Re-exports amounted to £16,133,560, and when this figure is compared with that of October of last year a decrease of £3,508,042 is shown; but in comparison with September an increase of £2,783,000 makes the situation brighter, and alleviates the adverse balance of trade.

Raw materials imported generally for the first ten months of this year show a steady increase. In many cases, however, considerable improvement is necessary to attain to the 1913 level. Tallow and hides is one item. Over one hundred million more gallons of petrol have been imported this year as compared with the same period last year.

Chemicals, drugs, dyes and colours imported last month were valued at £2,663,830, being an increase of £955,041, compared with October, 1919, and £1,416,119 more than for the same month 1913. Oilnuts and kernels imported show an increase both over last year and 1913, in the month of October, the figures being 62,870 tons, 1920; 59,726 tons, 1919; and 10,162 tons, 1913. Unrefined tallow declined, only 4,510 tons being imported during the month as compared with 6,905 tons last year, and 5,495 tons in the corresponding month, 1913. Petroleum imported in the month of October, 1920, 1919 and 1913, is given, respectively, as 69,953,994 gallons, 67,771,986 gallons and 49,708,691 gallons.

Coal

Remarkable as it may seem, exports of coal declined only by 58,125 tons in the month. The total quantity exported was 1,417,498 tons, against the September figure 1,475,623 tons. In viewing these figures it must be borne in mind that a full fortnight's production was lost by the miners' strike. For the ten months the aggregate shipments amounted to 21,269,053 tons, compared with 29,568,237 tons in the corresponding period of 1919, and 61,257,261 tons in the same period of 1913.

Russia and Germany are sending orders again and steady expansion of trade is taking place in that direction.

Dyes and Dyestuffs

Exports of dyes and dye-stuffs in the ten months to the end of October amounted to 25,093 tons, compared with 178,131 tons in the corresponding period of 1913. The values of the exports of chemicals, drugs, dyes and colours are shown for October, 1920, as £3,520,536, an increase of £1,166,970 over October, 1919, and £1,921,014 above the figure for that month in 1913.

Below we give figures showing last month's trade in given commodities exported, compared by quantity with October last year, and also 1913:

	Oct. 1913.	Oct. 1919.	Oct., 1920.
	Tons.	Tons.	Tons.
Oils, fats, &c. ...	10,188	15,221	10,173
Edible oils and fats ...	2,739	387	2,377
Salt ...	46,299	35,867	34,212
Coal ...	6,739,473	2,729,625	1,417,498
Coal, tar, pitch ...	42,683	32,883	63,874
Cement ...	63,508	35,179	63,382
Soda compounds ...	742,778	515,261	658,295
Dye Stuffs ...	17,963	27,442	25,093

In estimating values, it should be carefully considered that the great rise in price gives an inflated appearance to the amount of trade, by increasing the value figures enormously when the figures representing quantities may not be large compared with previous years.

From Week to Week

Professor Andre Dumont, of Louvain, whose death was announced on November 4, was the discoverer of the Limburg coalfield.

A discovery of lead has been made at Matlock by Mr. Herd, of Blackpool, who has obtained permission to sink a shaft to develop the vein.

For the purposes of surgical research the College de France in Paris has received from Mrs. Frances Bostwick a gift of 661 shares in the Standard Oil Co.

Professor McBain, Leverhulme Professor of Physical Chemistry in the University of Bristol, has been appointed president of the Bristol branch of the Association of University Teachers.

A memorandum, issued by the Chemical Employers' Federation, states that they cannot consent to a joint court of inquiry into the chemical trade as suggested by the trade union representatives of the Joint Industrial Council.

Carbon dioxide from a coke fire finding its way into a cellar was attended with fatal consequences at Leamington on Monday. Although a gas jet was lighted at four and a-half feet from the ground at three feet lighted matches were extinguished.

A fire broke out at the South-Eastern Margarine Co.'s factory, Broadway, Deptford, on November 6. Damage estimated at £10,000 was done. The roof and two floors of the building were destroyed and other damage was caused by melted margarine and water.

Fumes from a petrol fire pump were the cause of the death of two women during the rubber fire last week, at Wapping. In our last issue we stated that it was thought death was due to the fumes from the burning rubber, but at the inquest the jury were of opinion as above.

The death took place in Leeds on Monday last of Mr. Frederick Arthur White, the head of the well-known firm of J. F. White & Co., manufacturing chemists, of Benson Street, Leeds. Mr. White, who had been ailing for some time, was sixty-three years of age. He leaves a widow, two sons and a daughter.

Leeds University Colour Chemistry Department, under Professor A. G. Perkin, is playing a notable part in the training of chemists. There are now over 150 students in training, as compared with little more than 20 in 1913. Quite a number of students, who have qualified are now engaged in practical work for large firms in the district.

Swansea Harbour Trustees have entered into a further agreement with the Anglo-Persian Oil Co., in reference to land required by the company at Queen's Dock, Swansea. It is stated that the company, which is spending seven million pounds on its new refineries at Skewen and Swansea, is to commence operations in February.

Lever Brothers, Ltd., are to establish their headquarters in what was De Keyser's Hotel on the Victoria Embankment, near Blackfriars Bridge. The removal from Port Sunlight will take place gradually. Large numbers of the office staff are looking for housing accommodation, and have been given a week's holiday for that purpose. Only the managerial and clerical staffs are coming to London.

At the anniversary meeting on November 30 the following recommendations will be brought forward by the President and Council of the Royal Society: That Professor C. S. Sherrington be president, Sir David Prain, treasurer, Messrs. W. D. Hardy and J. H. Jeans secretaries, and Sir Arthur Schuster foreign secretary.

Alderman Tom Fox, Lord Mayor of Manchester, has been asked by the Lancashire trade unions in the bleaching, dyeing and finishing trade, to act as umpire in the arbitration on their application for an advance of 40 per cent. on current wages. Negotiations have been delayed because the Arbitrator appointed by the Ministry of Labour was objected to.

We are informed that E. Catchpole & Sons (London), Ltd., of Rotherhithe, and Thomas Crow & Sons, Ltd., of Barking, both concerns of over 60 years standing, have disposed of their tar-distilling business to Crow, Catchpole & Co., Ltd., whose

head office is at Hart's Lane, Barking. The managing directors are Messrs. Albert A. Catchpole, Fred E. Catchpole and H. Wilfrid Crow.

Mr. Cruickshank, Bucksburn, in the name of the members of the West Aberdeenshire Pharmacists' Association, presented Mr. Reith, Culz, with a handsome gold lever watch suitably inscribed, at the annual meeting last week. After referring to Mr. Reith's work as hon. secretary of the Association since its commencement in 1912, Mr. Cruickshank enumerated his many activities in advancing the weal of the craft.

At the monthly meeting of the Pharmacists' and Assistants' section of the National Warehouse and General Workers' Union, held at Newcastle, the new Unemployment Act as it affects chemists was considered, and it was recommended that members should use the union for its application. The union was instructed to take legal advice as to whether bound apprentices were at liberty to join a trade union.

One of the subjects to come before the League of Nations Assembly at Geneva will be the use of poison gas in warfare. On another page will be found a letter written by Professor Soddy in which he reveals the fact that the British War Office is forming a committee of scientific experts for the purpose of dealing with matters related to "chemical warfare."

Huddersfield Technical College Chemical Society held its first meeting at the Technical College on November 3. In introducing Professor Robinson, D.Sc., F.R.S. (director of pure research at the British Dyestuffs Corporation, Ltd.), Mr. W. E. Downey, the president of the society, expressed the hope that the society would eventually comprise all the chemists and students of chemistry in Huddersfield. Professor Robinson, in his lecture on "The Chemistry of the Genus Eucalyptus," dealt with the economic importance of the genus.

In the Great Hall, King's College, at 2.30 p.m. to-day (Saturday) will be held the public session of the annual general meeting of the Council of the National Union of Scientific Workers. The annual report which is to be presented contains some interesting items. It says after careful consideration it was finally decided that the N.U.S.W. approved scale of salaries should be fixed on a pre-war basis, and adjustment made for the increase in the cost of living by adding the Government Cost of Living bonus. A black list scheme for dealing with firms who advertise scientific posts at inadequate salaries is mentioned, and the report says the Union cannot take official action until redress has been applied for and refused. A beginning has also been made upon the much larger problem of the general underpayment of scientific workers in State and State-aided institutions, particularly universities and technical colleges.

On Saturday, J. H. Thompson, foreman, and John Waites, caulkier, in the employment of the Whessoe Foundry Co., Darlington, which is erecting the oil tanks at the National Oil Refineries Construction Works, Skewen, Swansea, entered the firm's wooden office on the works, and proceeded to light a fire. By some means the stove exploded, and the office, which contained several drums of oil, was soon in flames. In attempting to extinguish the outbreak both men were overcome by the fumes, and when help came they were unconscious and terribly burned. Waites died in the hospital later in the day, and Mr. Thompson was so severely burned about the face that the loss of an eye is feared. Eighty pounds in Treasury notes was lost in the fire, and a large amount in silver was melted.

Professor I. M. Heilbron, D.S.O., D.Sc., Ph.D., Heath Harrison Professor of Organic Chemistry in the University of Liverpool, delivered, on November 4, an inaugural lecture on "The Achievements of Modern Organic Chemistry." The Vice-Chancellor (Dr. Adami) presided over a large attendance. Professor Heilbron said that never had research in organic chemistry been of greater importance to the Empire, and if the terrible war had awakened a fuller appreciation of the importance of chemistry to every sphere in life some gain would have accrued. Liverpool University had four distinct Chairs of Chemistry. He gave an interesting survey of the improvements made in research work in organic chemistry, and spoke of the importance of the partnership between academic knowledge and industrial enterprise.

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British

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GAS. The industrial applications of gas. *Gas World*, November 6, 1920, pp. 369-371. Papers and discussions at the ninth Annual Conference of the British Commercial Gas Association, including "Gas as an aid to economy in the factory and workshop," A. J. Hobson; "Gas coke in relation to cheap power and smoke abatement," E. W. L. Nicol.

SULPHATE OF AMMONIA. Neutral sulphate of ammonia: the importance of a good-quality product. D. M. Watson. *Gas World* (Coking Section), November 6, 1920, p. 11.

GASOLINE. Absorption as applied to recovery of gasoline. *Gas World* (Coking Section), November 6, 1920, pp. 15-17. A résumé of Technical Paper No. 232 of the United States Bureau of Mines by W. P. Dykema and R. O'Neal.

OIL SHALES. Oil shales and their economic importance in the United States. *Gas World* (Coking Section), November 6, 1920, p. 18. A résumé of a Paper contributed to the Utah Academy of Sciences by M. J. Gavin, of the United States Bureau of Mines.

ZINC. The allotropy of zinc. K. A. Bingham. *The Metal Industry*, October 29, 1920, pp. 346-348.

CELLULOID. The celluloid industry. F. Sproxton. *Indiarubber J.*, November 6, 1920, pp. 9-10.

United States

GLASS. Optical glass and its future as an American industry. A. L. Day. *J. Franklin Inst.*, October, 1920, pp. 453-472.

FURNACES. The induction electrical furnace. G. H. Clamer. *J. Franklin Inst.*, October, 1920, pp. 473-508.

VARNISH. Varnish fume recovery. C. H. Jones. *Chem. & Met. Eng.*, October 20, 1920, pp. 771-776.

STEEL. Metallurgy of arc-fused steel. H. S. Rawdon, E. C. Groesbeck, and L. Jordan. *Chem. & Met. Eng.*, October 20, 1920, pp. 777-784.

CARBON. The disc, plate, and cylinder processes for the production of carbon black. R. O'Neal. *Chem. & Met. Eng.*, October 20, 1920, pp. 785-789.

OIL. Commercial retorting of oil shales. L. Simpson. *Chem. & Met. Eng.*, October 20, 1920, pp. 789-791.

French

HYDROSULPHITES. The hydrosulphites. A. Dubosc. *Rev. des Prod. Chim.* A series of articles continued through several recent numbers and still proceeding, discussing very fully the history, methods of preparation, properties, and constitution of the various inorganic and organic salts and derivatives of hydrosulphurous (hyposulphurous) acid.

THE NITROGEN CYCLE. Notes on the nitrogen cycle, "Nitricus." *Rev. des Prod. Chim.*, September 30, 1920, pp. 527-534, and October 15, 1920, pp. 563-569.

OILS. The hydrogenation of oils. M. Fréjacque. *Chim. et Ind.*, October, 1920, pp. 443-456.

ANALYSIS. Rapid electro-analysis. A. Kling and A. Lassieur. *Chim. et Ind.*, October, 1920, pp. 457-466.

Rapid estimation of antimony in antimoniated lead. L. Bertiaux. *Chim. et Ind.*, October, 1920, pp. 467-472.

Miscellaneous

NICKEL. The effect of raising the temperature and of depolarisers on the form of electrolytic deposition of nickel. H. Stäger. *Helv. Chim. Acta*, October 1, 1920, pp. 584-613.

The nature of the spontaneous changes of structure in deposited nickel. V. Kohlschütter. *Helv. Chim. Acta*, October 1, 1920, pp. 614-620.

SILICATES. The constitution of the silicates. J. Jakob. *Helv. Chim. Acta*, October 1, 1920, pp. 669-704.

Dangers of Oil Fuel

To the Editor of THE CHEMICAL AGE.

SIR,—Whilst reading the Editorial Article in your issue of October 30, entitled "The Dangers of Oil Fuel," it struck me that this might be elaborated with benefit to readers, particularly engineers, referring to the dangers of using creosote as an oil fuel.

You are no doubt aware that creosote in contradistinction to all petroleum fuel oils has a specific gravity heavier than water (1.050 to 1.070). In actual practice engineers of ships are not aware of this difference, so that their suction pipes are fixed some little distance from the bottom of the tank to avoid drawing water and dirt into the boilers.

This fact alone is of great danger to them when they have bunkered with creosote for the water floats on the top, and although they would imagine that they had plenty of fuel in their tanks, they might, all of a sudden, start sucking water, and owing to the pipe being fixed above the bottom of the tank be unable to get out the considerable quantity of creosote left in the bottom.

This may be a very real danger as it could easily put out the whole of the boilers and cause an accident. Possibly you would like to elaborate on this subject which I hope I have made quite clear.—Yours, &c.,

T. HOWARD BUTLER, Ph.D., M.Sc., F.I.C.

Bristol, November 8.

Persian Market for Dyes

It is reported in America that the following statement of the requirements for the importation of synthetic dyestuffs into Persia has been received from the Persian Legation:

Chemical firms who desire to export to Persia chemical dyestuffs must submit to the following formalities:—

To furnish a list of dyestuffs that they wish to export and to attach to that list for each day an official certificate issued by a Government or municipal laboratory stating that the dyes have been duly analysed and recognised as fast and possessing all the qualities as stated.

To send samples of each dye mentioned on the list.

To furnish 50 samples of each label that is used on the boxes containing the dyes.

To give a written agreement that the dyes for exportation in labelled boxes will be subjected to a strict examination and be identified with samples submitted.

To admit that the Persian Government has a right at any time to take any of the samples exported and to submit the same to an analysis and to suspend the authorisation of importation if the examination was not satisfactory.

Chemical Exports to Java

The following report on German Trade with Java has been received in the Department of Overseas Trade from the British Consulate General at Batavia: "It is too early to say that German trade with Netherlands India has been resumed on any very large scale. The local German mercantile community, however, is putting forth every effort to recapture, as far as possible, the leading position in this market which their country once held." As regards chemicals, it is stated that, prior to the war, there was a large German import in this line. The goods usually arrived, however, during the second half of each year, owing to certain exigencies of the local market.

Death of Mr. C. E. Acker

THE death is announced of Mr. Charles Ernest Acker, who built the works of the Acker Process Company, at Niagara Falls, and originated processes for the manufacture of tetrachloride of tin and carbon tetrachloride. He was granted about fifty United States and foreign patents for inventions relating to the chemical and electro-chemical industries. Mr. Acker was a director of the American Electrochemical Society, and a member of the Society of Arts, London; the Faraday Society, London; the American Chemical Society, the Society of Chemical Industry and other bodies.

Patent Literature

Abstracts of Complete Specifications

152,041. SEPARATING CRYSTALS FROM MOTHER LIQUORS CONTAINING MORE THAN ONE SALT. J. T. Windram, Norwich Union Buildings, Fox Street, Johannesburg, South Africa. Application date, August 13, 1918.

The object is to separate crystals of one salt from a solution containing other salts, without contamination by the mother liquor, e.g., sodium carbonate from liquor containing also common salt. The mixture of liquor and crystals is filtered in a centrifugal filter to remove most of the liquor, and is then immediately treated with a spray of water or wet steam. If no substantial variation of temperature occurs the liquor is removed without re-solution of the crystals or deposition of impurities from the liquor. The mixture is fed into and removed from the centrifugal separator when rotating at its normal speed.

152,051. ELECTRICAL DEPOSITION OF PARTICLES FROM GASES. Sir O. Lodge, L. Lodge and The Lodge Fume Deposit Co., Ltd. (in liquidation), Great Charles Street, Birmingham. Application date, April 14, 1919.

The receiving electrodes are constructed of parallel metal plates provided with transverse ridges or projections which prevent the deposit of dust from being carried along by the gases. The discharge electrodes are constituted by wires parallel to the plates but transversely to the flow of gas. The discharge electrodes are protected from the direct impact of the gases by deflectors arranged in front of them, which serve also to deflect the gas towards the receiving electrodes.

152,054. BENZOL, PROCESS AND APPARATUS FOR DEALING WITH THE ACID SLUDGE PRODUCED IN THE PURIFICATION OF—AND FOR RECOVERING BENZOL AND ITS HOMOLOGUES THEREFROM. G. Stephenson, 27, Grey Street, Crook, Durham. Application date, May 2, 1919.

The acid sludge is distilled in a shallow retort by means of steam injected into it from a perforated pipe and the resulting benzol vapour together with acid impurities pass into an outlet pipe. The vapour is treated with ammonia gas or ammonium carbonate spray so that the acid is neutralised and returns to the retort, while the benzol vapour passes forward. The vapour is passed through dilute sulphuric acid to absorb any ammonia, and the benzol vapour and its homologues pass on to a condenser.

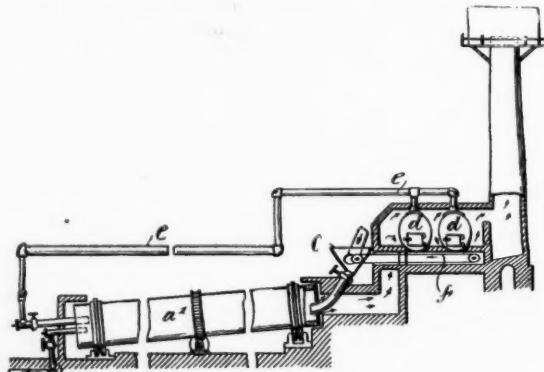
152,095. NITRATION OF OILS OR FATTY ACIDS. G. H. Howse, 34, Vicarage Road, Smethwick, Birmingham. Application dates, July 4 and August 16, 1919.

Vegetable, fish or animal oils, such as tung oil (Chinese or Japanese wood oil), castor oil, lumbang oil, ground-nut oil, cotton-seed oil, soya-bean oil, whale oil, linseed oil or herring oil, or fatty acids derived from these, are mixed with an inert solvent such as white petroleum spirit and then treated with pure nitric acid with agitation. Free nitric acid may be removed by adding lime, and the volatile solvent may be evaporated at a reduced pressure. The products are resistsants to water, acids, alkalies, gases, heat, steam, and chemical solutions, and may be used in making paints, varnishes, lacquers, cements, electric insulators, &c.

152,106. PORTLAND CEMENT, UTILISATION OF LOW-GRADE CARBONIFEROUS MATERIAL IN THE MANUFACTURE OF. R. W. Lesley, Haverford, Pa., U.S.A. Application date, July 4, 1919.

The object is to utilise low-grade carboniferous material such as oil shale, lignite, low-grade bituminous and cannel coal, waste coal, &c., in making Portland cement. The cement raw materials are fed by a hopper *c* into the upper end of inclined retorts *a*¹, which are supplied with gas or oil fuel through the pipe *b*. The hot gases pass from the retort to a chamber containing retorts *d* charged with low-grade carboniferous material, and this material is thereby distilled and the vapour conducted through a pipe *e* to a by-product recovery apparatus, or directly to the retorts *a*¹. The argillaceous residue from the retorts *d* is transferred by the

conveyor *f* to the hopper *c* so that it may be used as one of the cement raw materials. This residue contains considerable



152,106

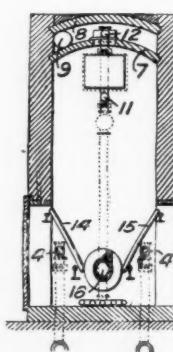
fixed carbon and furnishes the greater part of the fuel necessary in the clinkering operation.

Note.—Specification 129,996, which is now accepted, was abstracter when it became open to inspection under the International Convention. It relates to apparatus for recovering oil from shale and other carbonaceous materials. (See THE CHEMICAL AGE, Vol. I., p. 423.)

International Specifications Not yet Accepted

149,297. ZINC SULPHATE AND LITHOPONE. R. T. D. Williams R. T. Gepp and K. P. Webb, care of Electrolytic Zinc Co., of Australasia Proprietary, Risdon, Hobart, Tasmania. International Convention date, July 17, 1919.

Zinc sulphate containing manganese is purified by adding an alkali hypochlorite or a mixture of an alkali sulphate and bleaching powder. Alternatively bleaching powder may be first added, and then an alkali sulphate to replace the sulphate removed as calcium sulphate. By purification in this manner, equivalent quantities of the sulphate and sulphide radicals are present in the reaction for producing lithopone, and the lithopone obtained is resistant to sunlight.



149,303

149,303. ZINC OXIDE. H. E. L. Pievet, Paris. International Convention date, July 17, 1919.

Calamine or roasted blende is mixed with carbon and lime, and treated in a furnace 1, having a double inclined grate 14, 15, with a screw conveyor 16, between the two parts. Air is admitted by the pipes 4, to volatilise metallic zinc which is burnt at the top of the furnace by a hot air blast introduced through the pipe 11, and the zinc oxide fume passes out through the pipe 9. The air for the hot blast may be heated by passing it through the screw conveyor, which is hollow and is thereby cooled.

149,304. NITROGEN OXIDES. L'Azote Francaise Soc. Anon. 126, Rue de Provence, Lyons, France. (Assignees of P. A. Guye and A. Schmidt, Geneva). International Convention date, July 18, 1919.

Gas containing nitrogen oxides is passed over alumina which has been dehydrated at about 400°C., and the oxides are absorbed forming products such as $2\text{Al}_2\text{O}_3 \cdot \text{NO}_2$. The temperature of the gas when concentrated may be atmospheric, but when poor in nitrogen oxides should be -20°C. to -80°C. The nitrogen oxides are recovered by heating the

alumina to 70°–120°C., or to 40°C. in a partial vacuum. The alumina may be re-calcedined at 400°C. if moisture has been absorbed.

149,316. PIGMENTS. Titan Co., Fredriksstad, Norway. International Convention date, August 1, 1919.

Titanium hydrate or oxide, with or without barium or calcium sulphate and a small proportion of phosphoric acid or calcium phosphate, is calcined, and titanium oxide in a softer and whiter condition than heretofore, is obtained.

149,317. VISCOUS OILS. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, August 1, 1919.

Tar oil fractions boiling above 140°C. or constituents such as mesitylene or pseudo-cumene obtained from them, are treated with acetylene in the presence of aluminium chloride. The oil is separated, neutralised with lime or the acid removed by washing, and the product fractionated at 20 mm. pressure. A fluorescent oil passes over between 85°C. and 260°C., and is suitable for use as a lubricant.

149,318. ALKALI CELLULOSE. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, August 1, 1919.

Cellulose is impregnated with caustic alkali lye or water, and partly dried by suction or centrifuging. The material is then mixed with solid caustic alkali or a strong solution, giving an alkali cellulose containing little water and an excess of caustic alkali.

149,319. PLASTIC COMPOSITIONS. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, August 1, 1919.

The viscous oils described in 149,317, above, are mixed with alkyl, aryl, or aralkyl ethers of cellulose, starch, or dextrin. Volatile solvents such as benzene, benzene-alcohol, chloroform, acetone, &c., may also be added, and also other plastic substances such as cellulose esters, and softening agents such as camphor, phosphoric esters of phenols, oils, &c. The products may be used as indiarubber or leather substitutes, or as lacquers or impregnating agents. Other applications are also given.

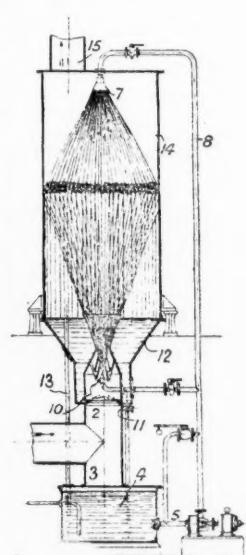
149,320. CELLULOSE ETHERS. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, August 6, 1919.

Lower alkylated ethers of carbohydrates such as cellulose, starch, dextrin, lichenin and inulin are converted into more highly alkylated ethyl, methyl, benzyl or other ethers by further alkylation in the absence of water, or with only small proportions of water. The process is described in detail, and the products are soluble in a large number of volatile solvents.

149,340-1. WASHING GASES. A. Knopfmacher, 12, Prinz Eugenstrasse, Vienna, and R. Adler, 49A, Fasangasse, Vienna. International Convention dates, April 12 and August 8, 1919.

149,340. Distillation gas is drawn into a pipe 2 and injected upwards into a chamber 14 by a jet 10. The spray from the jet and the tar in the gas produce a foam which is condensed by another spray, 7, which is directed downwards. The liquid falls into the bottom, 12, of the vessel, 14, the depth being regulated by the overflow pipe 13. The liquid collects in a tank, 4, and is again circulated to the jets, 7, and 10, by the pump, 5. Coarse suspended matter in the gas is removed by the spray, 11.

149,341. This is a patent of addition to 149,340. The condensates obtained as above are fractionally separated by treating the gas in two or more chambers in succession, the temperature being lower in each successive chamber.



149,340

149,347. PARAFFIN WAX. Deutsche Erdöl Akt.-Ges., 112, Kurfürstenstrasse, Berlin. International Convention date, July 31, 1919.

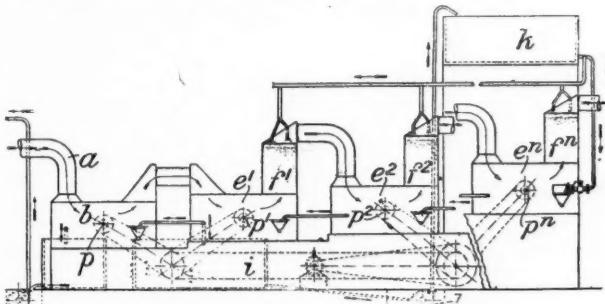
A mixture of paraffin wax and brown coal tar is heated to liquefy it, and then treated in counter-current with methyl, ethyl, or other alcohol, ethers, ketones, esters of acetic or other acid to dissolve the coal tar, and thus separate the paraffin wax.

149,354. DYES AND INTERMEDIATES. R. Arnot 69, Neptunstrasse, Zurich, Switzerland. International Convention date, May 7, 1917.

Retene is nitrated with fuming nitric acid, and the product dissolved in alcoholic caustic soda and reduced with hydro-sulphite. The aminoretene obtained is diazotised and coupled with R-salt, G-salt, "Andersen's salt," H.acid, or α -naphthol. Other examples using retene derivatives are also given.

149,648. SULPHURIC ACID. T. Schmiedel, 72, Schwanthalstrasse, Doss, Nurnberg, and H. Klencke, Frankfurt-on-Main, Germany. International Convention date, August 8, 1919.

Gases containing sulphur dioxide pass through the pipe *a* to a chamber *b* and then to a series of mixers *e¹*, *e²*, *e³*, where they are treated with a large quantity of nitrosyl sulphuric acid at 54–58° Bé., in the form of spray. The unabsorbed gas passes through irrigators *f¹*, *f²*, *f³*. The nitrosyl sulphuric acid is supplied from the tank *k* to the irrigators and also to the



149,648

mixers, and the spray is produced by rollers *p*, *p¹*, *p²*, *p³*. About 50 per cent. of the sulphur dioxide is oxidised in a mixer and oxidation then ceases owing to the increase in concentration of the sulphuric acid and formation of nitrosyl sulphuric acid. This acid, together with the nitrous gases liberated in the reaction, is removed by washing in the irrigator. Part of the acid is tapped off from the mixer *e³* to the denitritor *b* and removed from the system, the remainder being returned to the tank *k*.

149,662. SULPHUR DIOXIDE. Verein Chemischer Fabriken Mannheim, Wohlgelegen, Mannheim, Germany. International Convention date, August 8, 1919.

Sulphates of the alkaline earths or of magnesium or iron are heated with iron or other metal, lower metal oxides, or coal in sufficient quantity to reduce the sulphates to sulphites. If sufficient reducing agent to reduce the sulphate to sulphide is used, the reduction is first effected at 600°C. and then at 900°C. to expel sulphur dioxide and sulphuric acid. Examples are given of the treatment of gypsum, &c., to produce sulphur dioxide.

149,667. SULPHURIC ACID CHAMBERS, &c. P. L. Pfannenschmidt, 2, Gutenbergstrasse, Jena, Germany. International Convention date, July 31, 1919.

Acid-proof chambers, towers, or other structures are formed of a window-shaped framework of iron coated with enamel or lead, or of "neutral" iron or aluminium, in which are inserted sheets of quartz glass, enamelled metal, or glass. Details of the construction are given.

149,670. MAGNESIUM CHLORIDE. H. J. Bull, 6, Soartediksvieen, Bergen, Norway. International Convention date, August 6, 1919.

Magnesia, magnesite, dolomite, or hydrated magnesium

chloride is heated with carbon tetrachloride or phosgene to 500°C.-600°C. to produce anhydrous magnesium chloride. Magnesium may be obtained from the latter by electrolysis and the chlorine used to prepare the carbon-chlorine compound for the first stage of the process.

LATEST NOTIFICATIONS.

- 153,290. Catalyst for the synthetic manufacture of ammonia, and process of producing same. Norsk Hydro-Elektrisk Kvaestof-Aktieselskab. October 28, 1919.
- 153,007. Process of rendering boronatrocacite soluble. Schott & Gen. October 24, 1919.
- 153,297. Process for obtaining sulphur or for treating and purifying gases containing hydrogen sulphide. Farbenfabriken vorn F. Bayer & Co. October 30, 1919.
- 153,254. Catalytic materials adopted for use in the synthesis of ammonia. Soc. L'Air Liquide. October 28, 1919.
- 153,263. Purification of blast furnace and generator gases. Klarding N. October 31, 1919.
- 153,265. Process for the production of dinitrophenol. Norsk Hydro-Elektrisk Kvaestof-Aktieselskab. October 29, 1919.

Specifications Accepted, with Date of Application

- 139,753. Sodium perborate. Manufacture of. Fredriksstad Elektrokemiske Fabriker Aktieselskabet. March 4, 1919.
- 152,724. Ores, minerals and the like, Machines for grinding. J. R. Broadley. July 8, 1919. Addition to 116,583.
- 152,740. Hydrogenation processes, Method of applying nickel carbonyl in. R. Lessing. July 15, 1919.
- 152,741. Wood, woody fibre and similar carbonaceous substances, Destructive distillation of. P. Poore. July 15, 1919.
- 152,752. Zinc solutions, Treatment of. F. Petersson and Metals Extraction Corporation. July 17, 1919.
- 152,766. Sulphate of ammonia, Manufacture of. R. Lessing. July 21, 1919.
- 152,791. Petroleum or other hydrocarbons, or mixture of volatile liquids. Apparatus for continuous distillation, and continuous fractionation of. H. L. Allan. July 24, 1919.
- 152,879. Electrolytic apparatus. A. E. Ashcroft. July 9, 1919.
- 152,887. Sulphide ores, Extraction of sulphur from. H. C. Pederson. December 10, 1919.

Applications for Patents.

- Aitchison, L. and Dyson, W. H. Purification of metallic ores or residues containing metallic oxides. 30,507. October 28.
- " Purification of tungsten ores and residues containing oxide of tungsten. 30,508. October 28.
- Black, J. S. Retorts for distillation of oil-bearing shales, &c. 30,724. October 30.
- Boynton, V. K. Process of producing interactions between gas and a liquid. 30,354. October 27. (United States, November 20, 1919.)
- Camus, E., Criquebeuf, G. and Duchemin, R. Manufacture of acetic acid and its homologues. 30,311. October 26.
- Chaillaux, P. Manufacture of gold-coloured sulphurs and ver-millions of antimony. 30,268. October 26.
- Dacey, W. D. Means for rubberising hides or skins. 30,159. October 25.
- Dootson, F. W. Production of light oils, lubricating oils, and gas by cracking pitch and heavy oils. 30,127. October 25.
- Macclaren, A. F. Utilisation of wet powdered fuel. 30,749. October 30.
- Mather, J. C. Means of applying blues and dyes. 30,337. October 27.
- Nitrum Akt.-Ges. Process for changing lime-nitrogen into urea. 30,116. October 25. (Switzerland, November 7, 1919.)
- Sauer, J. N. A. Neutral and sterile decolorising carbon. 30,285. October 26.
- American Cotton Oil Co. Hydrogenation of oils and liquid fats. 31,145. November 3.
- Baddiley, J. British Dyestuffs Corp. and Wignall, H. Manufacture of ortho-sulphonic acids of aromatic amines. 31,140. November 3.
- Buffalo Refractory Corporation. Refractory compositions. 30964. 30965. November 2.
- Dykes, J., and Maconochie, H. Furnaces for and manufacture of zinc oxide. 31,077. November 3.
- Fabriques de Produits Chimiques de Thann et de Mulhouse. Manufacture of borneol. 30,873. November 1. (France, February 4.)
- Fraymouth, W. A., and Kestner Evaporator Engineering Co. Separating impurities from sticklac to obtain pure lac resin. 31,199. November 4.
- Hartner, F. Manufacture of mortar-forming material from anhydrite &c. 31,358. November 5. (Germany, November 25, 1919.)
- Haynes, T.H. Production of carbon. 31,327. November 5.
- Hearson, J. W. Apparatus for gasification of solid fuel, tar, and oils. 31,174. November 4.
- Jones, R. F., and McKean, J. J. Liquid-fuel atomizers. 31,393. November 6.

Kunheim & Co. Pyrophoric igniter of cerium metal alloys. 30,853. November 1. (Germany, October 31, 1919.)

McKean, J. G. Liquid-fuel atomizers. 31,393. November 6.

Morgan, J. S. Process of heating substances for producing chemical changes. 30,975. November 2.

Oil Extractors, Ltd. Retorts for low-temperature distillation. 31,200. November 4.

Parodi, P. Extraction and refining of oils &c. 31,436. November 6. (France, March 20, 1918.)

Payman, J. B. Manufacture of ortho-sulphonic acids of aromatic amines. 31,140. November 3.

Schantz, K. Process of producing chloride of mercury. 31,350. November 5.

Shewring, F. Apparatus for gasification of solid fuel, tar, and oils. 31,174. November 4.

Soc. d'Exploitation des Brevets C. Arnould. Obtaining pitch from tar, &c., oils. 31,265. November 4. (France, August 13.)

Thermal Industrial & Chemical (T.I.C.) Research Co. Process of heating substances for producing chemical changes. 30,975. November 2.

Williams, W. M. Production of carbon. 31,327. November 5.

Wohl, A. Production of aldehyde and acetic acid. 31,195. November 4. (Germany, November 24, 1919.)

Wolcott, E. R. Process for producing aluminium chloride. 30,793. November 1.

Obligation Week

AN appeal has been issued by the Minister of Labour on behalf of probably not less than a quarter of a million disabled and fit ex-service men and ex-officers still unemployed. He has organised a special effort whereby the attention of the public may be focussed on the matter. During Armistice Week it was proposed that—to use the phrase of His Majesty the King—"the dear obligation" of the civilian to the Forces should be considered. The Minister of Labour therefore proposed that an appeal to employers to re-absorb the workless ex-service men and ex-officers should be made during that period from every association in which men and women bind themselves for service.

The Chemists' Atom

YORKSHIRE Natural Science Association on Saturday, November 6, elected Professor Arthur Smithells, F.R.S., of Leeds University to be president in succession to Sir William Bragg. The "Chemists' Atom" was dealt with by Professor Smithells in his presidential address. This new theory was propounded by Irving Langmuir of Schenectady. Speaking of the interpretation of science Professor Smithells said it was becoming increasingly necessary. He traced the development of atomic theories from John Dalton to Rutherford and Bohr, after which he said Langmuir had boldly explored the whole field of sub-atomic electrons. Outlining the hypothesis that the nucleus of the atom was charged positively, and the electrons were negative; that the atom consisted of a series of concentric spheres; that the maximum electrons in the first sphere was two, and in the second sphere eight, and other proportions for the outer spheres, Professor Smithells said the number of electrons determined the chemical properties of the element, and many chemical reactions were largely explained by the tendency to form octets.

Training of Chemists

EXPRESSION is given in the October issue of the *Journal and Proceedings* of the Institute of Chemistry to the Council's views as to the training of chemists. It is stated: "While the Council consider it desirable that all who intend to practise the profession of chemistry should attend a systematic day course of training at a recognised college, they know in many cases this is impossible. Chemistry is now taught as a regular subject in most secondary schools, and many boys are anxious to take up work involving the application of science; but few can win scholarships, and the parents of the others cannot in many cases afford to support them and pay college fees. At the same time, many simple routine chemical operations can be performed by well-educated youths after a little training and, in most laboratories, there is a demand for chemical assistants. The Council are anxious, however, that these youths shall not be led into a "blind alley" occupation, and shall not become mere craftsmen, adepts in one or two operations, who by styling themselves chemists are liable to give rise to a mistaken impression of the qualifications required for the profession."

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co. and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

Market Report

THURSDAY, November 11.

There is a distinctly healthier tone in chemicals, and the reports to the effect that textile and other basic industries are receiving more orders tends to the belief that the demand for chemicals will steadily improve. Changes in value are few and far between. The export business remains unsatisfactory owing to the continued violent fluctuation of many of the principal exchanges.

General Chemicals

ACETONE is decidedly firmer in price and is in active inquiry for both home trade and export.

ACID ACETIC is in steady demand. Unchanged in price.

ACID CARBOLIC shows no improvement and is still in buyers' favour.

ACID FORMIC.—The present prices are said to be unattractive to the makers, and any considerable increase in demand might be expected to enhance its value.

ACID OXALIC is in slow inquiry and remains easy in tone.

ACID TARTARIC.—Stocks are very much reduced, and the market appears to have become much more stable.

ACID CITRIC is uninteresting, but without change in value.

BLEACHING POWDER.—A fair amount of business is reported for export and sales are said to have been made at the prices that have been indicated for some few weeks.

COPPER SULPHATE is still in the doldrums and continues to be acutely affected by the exchange situation.

LEAD SALTS are in quiet demand and have no special feature.

POTASSIUM NITRATE.—There has been quite an active demand for this material during the past few days at last quoted figures.

POTASSIUM PRUSSIATE.—Stocks are still short, and the improvement in value indicated last week is fully maintained.

SODA CAUSTIC.—There does not appear to have been any important volume of business. Prices are unchanged.

SODA PHOSPHATE remains easy owing to the limited demand.

SODA PRUSSIATE is still in inquiry for export, but it would appear that only a limited business is passing as manufacturers are well booked for some time ahead.

Bichromates

Active business has been done during the past week as the majority of consumers have placed their contracts for next year's requirements. The prices are as reported in our last issue.

Coal Tar Intermediates

There is very little change in the market position of intermediate products.

ALPHTANAPHTHOL.—A steady business is being transacted without change in value.

BETANAPHTHOL continues somewhat weak in the absence of any sustained demand. The price is nominally without change.

BENZIDINE BASE is in short demand and price is inclined to be somewhat easier.

H. ACID is firm at last quoted figures.

PARANITRANILINE is fairly steady, but little business is passing.

RESORCIN is in good demand especially for technical material.

SALICYLIC ACID is stagnant without further change in price.

Coal Tar Products

There are signs of weakness in various coal tar products, and the volume of business passing is not great.

BENZOL 90 PER CENT. is slightly easier and worth about 3s. 7d. to 3s. 8d. in the North, and 3s. 10d. to 3s. 11d. in the South.

PURE BENZOL remains steady in the region of 4s.

CREOSOTE OIL has a fairly good market and is worth 1s. 2d. in the North and 1s. 3d. in the South.

CRESYLIC ACID.—Prices are ranging from 3s. 9d. to 3s. 11d. for 95/97 per cent. and 4s. 6d. to 4s. 9d. for Pale 97/99 per cent.

SOLVENT NAPHTHA remains in the region of 3s. on rails.

HEAVY NAPHTHA is steady at 3s. 3d. to 3s. 4d.

NAPHTHALENE.—The crude qualities are somewhat firmer, prices ranging from £14 to £26 per ton, while refined naphthalene is very slow and prices are about £40 to £45.

PTCH.—The market remains quiet, and somewhat lower prices have been accepted. To-day's quotations are 21s. 6d. to 22os. f.o.b. East Coast, and 22os. to 225s. f.o.b. London.

Sulphate of Ammonia

Remains unchanged.

Current Prices

Chemicals

	per	lb.	£	s	d.	per	lb.	£	s	d.
Acetic anhydride	0	3	9	to	0	4	0			
Acetone oil	ton	90	0	0	to	95	0	0		
Acetone, pure	ton	120	0	0	to	125	0	0		
Acid, Acetic, glacial, 99-100%	ton	100	0	0	to	105	0	0		
Acetic, 80% pure	ton	72	10	0	to	75	0	0		
Arsenic	ton	100	0	0	to	105	0	0		
Boric, cryst.	ton	74	10	0	to	76	0	0		
Carbolic, cryst. 39-40%	lb.	0	0	10½	to	0	0	11		
Citric	lb.	0	3	6	to	0	3	9		
Formic, 80%	ton	115	0	0	to	120	0	0		
Gallic, pure	lb.	7	3	to	0	7	6			
Hydrofluoric	lb.	0	0	8½	to	0	0	9		
Lactic, 50 vol.	ton	58	0	0	to	60	0	0		
Lactic, 60 vol.	ton	67	10	0	to	70	0	0		
Nitric, 80 Tw.	ton	41	0	0	to	44	0	0		
Oxalic	lb.	0	1	10	to	0	1	11		
Phosphoric, 1.5	ton	65	0	0	to	67	0	0		
Pyrogallic, cryst.	lb.	0	11	6	to	0	11	0		
Salicylic, Technical	lb.	0	2	0	to	0	2	3		
Salicylic, B.P.	lb.	0	2	11	to	0	3	0		
Sulphuric, 92-93%	ton	8	10	0	to	8	15	0		
Tannic, commercial	lb.	0	3	6	to	0	3	9		
Tartaric	lb.	0	2	6	to	0	2	7		
Alum, lump	ton	19	10	0	to	20	0	0		
Alum, chrome	ton	75	0	0	to	77	10	0		
Alumino ferric	ton	9	0	0	to	9	10	0		
Aluminium, sulphate, 14-15%	ton	17	10	0	to	18	10	0		
Aluminium, sulphate, 17-18%	ton	20	10	0	to	21	10	0		
Ammonia, anhydrous	lb.	0	2	2	to	0	2	4		
Ammonia, 880	ton	43	0	0	to	45	0	0		
Ammonia, 920	ton	30	0	0	to	32	10	0		
Ammonia, carbonate	lb.	0	0	7½	to	—				
Ammonia, chloride	ton	95	0	0	to	100	0	0		
Ammonia, muriate (galvanisers)	ton	60	0	0	to	65	0	0		
Ammonia, nitrate	ton	55	0	0	to	60	0	0		
Ammonia, phosphate	ton	120	0	0	to	125	0	0		
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	3		
Amyl acetate	ton	420	0	0	to	425	0	0		
Arsenic, white, powdered	ton	80	0	0	to	82	0	0		
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0		
Barium, chlorate	lb.	0	0	11	to	0	1	0		
Chloride	ton	27	0	0	to	28	0	0		
Nitrate	ton	55	0	0	to	56	0	0		
Barium Sulphate, blanc fixe, dry	ton	30	0	0	to	31	0	0		
Sulphate, blanc fixe, pulp	ton	16	10	0	to	17	0	0		
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	8		
Bleaching powder, 35-37%	ton	31	0	0	to	32	0	0		
Borax crystals	ton	41	0	0	to	42	10	0		
Calcium acetate, Brown	ton	20	0	0	to	21	0	0		
„ Grey	ton	30	0	0	to	32	0	0		

	per	£	s.	d.	per	£	s.	d.
Calcium Carbide	ton	30	0	0	to	32	0	0
Chloride.....	ton	12	10	0	to	13	0	0
Carbon bisulphide.....	ton	65	0	0	to	67	0	0
Casein, technical	ton	75	0	0	to	80	0	0
Cerium oxalate.....	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	2	to	0	1	4
Cobalt acetate	lb.	0	13	0	to	0	14	0
Oxide, black	lb.	0	17	0	to	0	18	0
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	42	0	0	to	44	0	0
Cream Tartar, 98-100%	ton	225	0	0	to	230	0	0
Epsom salts (<i>see</i> Magnesium sulphate)								
Formaldehyde 40% vol.	ton	205	0	0	to	210	0	0
Formusol (Rongalite)	lb.	0	4	9	to	0	5	1
Glauber salts	ton	Nominal.						
Glycerine, crude.....	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	9	to	0	2	10
Iron perchloride	ton	50	0	0	to	52	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	72	10	0	to	75	0	0
Carbone, white Lead)	ton	61	0	0	to	63	0	0
Nitrate.....	ton	65	0	0	to	67	0	0
Litharge	ton	57	0	0	to	59	0	0
Lithopone, 30%	ton	48	0	0	to	49	0	0
Magnesium chloride.....	ton	15	10	0	to	16	10	0
Carbonate, light.....	cwt	3	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	12	10	0	to	13	0	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate.....	ton	190	0	0	to	—		
Sulphate	ton	130	0	0	to	135	0	0
Methyl acetone	ton	95	0	0	to	100	0	0
Alcohol, 1% acetone	gall.	Nominal.						
Nickel sulphate, single salt	ton	60	0	0	to	62	0	0
Nickel ammonium sulphate, double salt.....	ton	62	0	0	to	64	0	0
Potassium bichromate	lb.	0	1	6	to	0	1	7
Carbonate, 90%	ton	105	0	0	to	110	0	0
Chloride.....	ton	50	0	0	to	52	0	0
Chlorate	lb.	0	0	9½	to	0	0	10½
Meta bisulphite, 50-52%	ton	225	0	0	to	230	0	0
Nitrate, refined	ton	65	0	0	to	67	0	0
Permanganate	lb.	0	3	6	to	0	3	9
Prussiate, red	lb.	0	4	0	to	0	4	3
Prussiate, yellow	lb.	0	2	0	to	0	2	1
Sulphate, 90%	ton	31	0	0	to	33	0	0
Sal ammoniac, firsts	cwt.	5	10	0	to	—		
Seconds	cwt.	5	5	0	to	—		
Sodium acetate	ton	50	0	0	to	52	0	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	1	2	to	0	1	3
Bisulphite, 60-62%	ton	47	10	0	to	50	0	0
Chlorate	lb.	0	0	5½	to	0	0	5½
Caustic, 70%	ton	31	0	0	to	32	0	0
Caustic, 76%	ton	32	10	0	to	33	0	0
Hydrosulphite, powder, 85%	lb.	0	4	6	to	0	4	10
Hyposulphite, commercial	ton	35	10	0	to	37	10	0
Nitrite, 96-98%	ton	75	0	0	to	77	0	0
Phosphate, crystal	ton	41	0	0	to	42	0	0
Perborate	lb.	0	2	2	to	0	2	4
Prussiate	lb.	0	1	2½	to	0	1	3½
Sulphide, crystals	ton	25	0	0	to	27	10	0
Sulphide, solid, 60-62%	ton	45	0	0	to	47	0	0
Sulphite, cryst.....	ton	17	10	0	to	18	10	0
Strontium carbonate	ton	85	0	0	to	90	0	0
Strontium Nitrate	ton	90	0	0	to	95	0	0
Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	19	0	0	to	19	10	0
Roll	ton	19	0	0	to	19	10	0
Tartar emetic	lb.	0	3	0	to	0	3	2
Tin perchloride, 33%	lb.	0	2	6	to	0	2	7
Perchloride, solid	lb.	0	3	0	to	0	3	3
Protocloride (tin crystals)	lb.	0	2	0	to	0	2	1
Zinc chloride, 102 Tw.	ton	22	0	0	to	23	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0
Oxide, 99%	ton	56	0	0	to	57	0	0
Dust, 90%	ton	90	0	0	to	92	10	0
Sulphate	ton	21			to	23	10	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	4	0	to	0	4	3
Alphanaphthol, refined	lb.	0	5	0	to	0	5	3
Alphanaphthylamine	lb.	0	3	6	to	0	3	9
Aniline oil, drums extra	lb.	0	1	8	to	0	1	9
Aniline salts	lb.	0	1	10	to	0	2	0
Anthracene, 85-90%	lb.	—			to	—		

	per	£	s.	d.	per	£	s.	d.
Benzaldehyde (free of chlorine)	lb.	0	5	9	to	0	6	0
Benzidine, base	lb.	0	13	6	to	0	14	0
Benzidine, sulphate	lb.	0	10	6	to	0	11	0
Benzoic acid	lb.	0	4	0	to	0	4	3
Benzoate of soda	lb.	0	4	3	to	0	4	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate.....	lb.	0	14	0	to	0	14	6
Betanaphthol	lb.	0	4	0	to	0	4	3
Betanaphthylamine, technical	lb.	0	11	6	to	0	12	6
Croceine Acid, 100% basis	lb.	0	5	0	to	0	6	3
Dichlorbenzol	lb.	0	0	6	to	0	0	7
Diethylaniline	lb.	0	7	9	to	0	8	6
Dinitrobenzol	lb.	0	1	4	to	0	1	5
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	6	to	0	1	8
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	5	9	to	0	6	0
Diphenylamine	lb.	0	5	0	to	0	5	3
H-Acid.....	lb.	0	14	6	to	0	15	0
Metaphenylenediamine	lb.	0	5	9	to	0	6	0
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	6
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthionic acid, crude	lb.	0	5	0	to	0	5	6
Naphthionate of Soda	lb.	0	6	0	to	0	6	3
Naphthylamin-di-sulphonic-acid...	lb.	0	5	6	to	0	6	6
Nitronaphthaline	lb.	0	1	6	to	0	1	8
Nitrotoluol	lb.	0	1	3	to	0	1	4
Orthoamidophenol, base.....	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	6	to	0	2	9
Orthonitrotoluol	lb.	0	1	3	to	0	1	4
Para-amidophenol, base	lb.	0	12	6	to	0	13	0
Para-amidophenol, hydrochlor	lb.	0	13	0	to	0	13	6
Paradichlorbenzol	lb.	0	0	6	to	0	0	8
Paranitraniline	lb.	0	8	0	to	0	8	3
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paramitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	13	6	to	0	14	6
Paratoluidine	lb.	0	8	6	to	0	9	6
Phthalic anhydride	lb.	0	4	9	to	0	5	0
R. Salt, 100% basis	lb.	0	4	0	to	0	4	2
Resorcin, technical	lb.	0	11	6	to	0	12	6
Resorcin, pure	lb.	0	17	6	to	0	18	0
Salol	lb.	0	5	3	to	0	5	9
Shaeffer acid, 100% basis	lb.	0	3	6	to	0	3	0
Sulphanilic acid, crude	lb.	0	1	8	to	0	1	9
Tolidine, base	lb.	0	10	6	to	0	11	0
Tolidine, mixture	lb.	0	3	0	to	0	3	6

Import Restrictions in Brazil

Brazilian regulations governing the importation and sale of chemical fertilisers, as established by a presidential decree, No. 14,177, of May 19, 1920, have been approved by a presidential decree, No. 14,177, of May 19, 1920, and are now in force. According to the provisions of this law, it is prohibited to sell or expose for sale chemical fertilisers which, through misrepresentation as to their nature, origin, composition, or by the use of a name employed in the designation of other fertilising substances, deceive the purchaser. In case of the violation of this provision, the seller shall be subject to a fine of 15 to 30 per cent. of the value of the fertilisers sold, and from 50 to 100 milreis (milreis=about 22 cents) for exposing for sale. In case of a repetition of the offence the fine shall be doubled.

£25 net d./d.
£30 to £40
3s. 5d. to 3s. 10d.
3s. 5d.
3s. 6d.
3s. 6d.
£16 to £26.
20s. to 22s.
1s. 2d. to 1s. 4d.
3s. 5d. to 3s. 10d.
1s. 9d.
4s.

Company News

ANGELA NITRATE.—An interim dividend of 10 per cent. has been declared. No interim was paid last year.

BENZOL AND BY-PRODUCTS.—For the five months ended August 31 a dividend at the rate of 10 per cent. will be paid on the Preference Shares on November 16.

BRITISH OXYGEN.—A disposal balance of £132,044, subject to Government tax, is shown on the British Oxygen Co.'s report for the year ended March 31. This balance occurs after deducting £37,500 for the final dividend of 2s. per share and bonus of 6d. (making 17½ per cent., tax free, for the year).

ALLEN-LIVERSIDGE, LTD.—Allen-Liversidge, the Imperial Light, and the Dissolved Acetylene Companies have amalgamated under the name of Allen-Liversidge, Limited, with nominal share capital £300,000, of which £193,720 has been issued and fully paid. Mr. E. W. Prott becomes joint managing director with Messrs. T. G. Allen and P. B. Liversidge.

POWER SPIRITS, LTD.—With a capital of £30,000 in £5 shares, Power Spirits, Ltd., was registered on November 4 to acquire and turn to account patents and rights relating to the production of combustible spirits, oils and gases, acetic acid, solvents and other chemical products, and to adopt an agreement with Power Gas Corporation, Ltd., and H. Langwell.

JUTE INDUSTRIES, LTD.—Two and a half million £1 cumulative participating preference shares entitled to a fixed cumulative dividend of 9 per cent. and to an additional distribution up to 6 per cent. out of one-third of the remainder of the profits distributed, will shortly be offered for sale by Jute Industries, Ltd. The offer will be made through the London Joint City & Midland Bank and the Clydesdale Bank.

AMELIA NITRATE.—Gross trading profits of this company for the year to June 30 amount to £89,331, income on investments £3,162, and £388 was brought in, making £92,881. Deducting administration expenses, contribution to propaganda and interests, &c., there is an available net profit of £86,376. After payment of the preference dividend, the directors propose a dividend on the ordinary shares of 20 per cent., less tax, carrying forward £52,176.

NITRATE ASSOCIATION.—The Chilian Congress has recently discussed a project designed to induce all nitrate producers to join a new association with a proposed capital of £2,000,000. Producers and the Government would subscribe equally. The existence of the combine depends on the adhesion of 51 per cent. of the productive capacity, instead of 80 per cent. as hitherto. By way of inducement it is proposed to increase the export duty from \$3.38 per metric quintal to 5 gold dollars, with a rebate of \$1.62 to members of the Association.

MAGADI SODA.—The report of the Magadi Soda Co. shows that the debit at profit and loss account has been increased by £96,832 to £197,731, besides which sundry items of preliminary expenditure have not been written off. It is hoped that at the meeting on Monday some intimation will be made of a commencement of operations at Lake Magadi which have been long delayed owing to war and labour conditions. Restarting of operations is alluded to in the report as now imminent.

AFRICAN AND EASTERN.—The ordinary shareholders met to consider the scheme of amalgamation with Lever Brothers, and the result was that the scheme was carried by an overwhelming majority. A poll was taken, but the result has not yet been declared. Resolutions were then carried at an extraordinary meeting. An amendment was put forward by a shareholder to the effect that the four million Lever 20 per cent. "A" Preference shares should be put in trust, as a "security" of the "A" and "E" shares should it ever be necessary. The amendment was refused.

BRUNNER MOND & CO.—An interim dividend of 5 per cent. actual on the ordinary shares of Brunner Mond & Co. has been declared for the six months ended September, which is the same rate as for last year and the year before, and when the accounts for 12 months were completed the distributions were made up to 10 per cent. for 1918-19 and 11½ per cent. for 1919-20. A profit of £2,100,000 was made in the year ended March last, on the book value of shares in

Joseph Crosfield & Sons and William Gossage & Sons, which it sold to Lever Brothers, but the money was treated as capital. The ordinary profit was £1,129,150, as compared with £1,012,081 in 1918-19 and £1,111,848 in 1917-18.

LANGDALE'S CHEMICAL MANURE.—Mr. W. B. Van Haansbergen, presided over the forty-ninth annual meeting of Langdale's Chemical Manure Co., at Newcastle, on November 6, and, in moving the adoption of the annual report, said he thought the balance-sheet was a good one. He referred at length to the incidence of excess profits duty in the chemical industry. He would be the last to complain of any impost which fell with equal incidence upon all industries, but, in their case, the inequality of the tax was most marked, and if there were any justification for its infliction in varying degrees upon different industries one would have thought that, had it fallen upon those which were most prosperous in the past they could not have taken so much objection; but when it fell by far the heavier upon those who had been unfortunate in their previous dealings, like themselves, who had not had a datum line at all, but were dependent on what the Government chose to give—in this case, 6 per cent.—he suggested that there was no sense in restricting the profits of a company like theirs, and at the same time the Government offered the same rate of interest on housing bonds, yielding increment without work. During the year they had had many inquiries from abroad both from old and new customers, but it had been impossible to definitely fix contracts, principally owing to the inability to obtain licences, coal restrictions and the growing foreign competition of Belgium and the States. The reluctance of our Government to grant export licences for the manufactured article was largely due to the difficulty in obtaining the raw material from the French North African colonies, the French Government only allotting a small percentage of the output to Great Britain. The profit for the year was £10,799 4s. 5d., as against £6,804 15s. 7d. for the preceding year. Property stood as last year, but there were increased assets in stocks by £3,000. Debtors were over £3,000 less, which showed that the British farmer had been paying up well. Mr. E. L. Beckingham seconded the report, which was adopted. A dividend at the rate of 7½ per cent. was confirmed. The chairman and Mr. Beckingham were re-elected directors.

R. W. Greeff & Co.

Registered as a Limited Company

It is officially announced that the business of R. W. Greeff & Co., Thames House, Queen Street Place, E.C.4, has been registered as a limited company, of which Mr. Alfred John Thompson becomes managing director. Captain E. M. de Greeff, the son of the founder of the business, has joined the board, as well as Mr. A. E. Munns, Mr. C. Lorleberg, Mr. A. F. Butler and Mr. P. A. Smith. Mr. E. Arnold becomes secretary to the company. The last-mentioned four gentlemen have long managed departments of the business, and will continue to do so. The heads of departments, staff and general organisation remain unchanged, and the business will be carried on upon the same lines as heretofore. All accounts payable to R. W. Greeff & Co. should be paid to the company, whose receipt will be a full discharge.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Australia ...	Paints ; varnishes...	598
Victoria ...	Disinfectants	608
Milan...	Fats and greases for soap making	627

Solving the Transport Problem

Benn Brothers' New Weekly Journal and Freight Exchange

A NEW journal generally announces that it requires to make no apology for its appearance, and that it responds to a well-defined demand. But *The Transport World and Motor Freight Exchange: the Journal of the Road-carrying Industry*, which Benn Brothers, Ltd., announce to appear in the first week of the New Year, is hardly able in all the circumstances to follow this tradition. To begin with, it does require a very distinct apology for venturing to enter the publishing field with a new weekly paper at this juncture. If not an apology at least a good explanation is certainly needful. Those who know anything of the paper and printing market will agree that these are not the times that the expert publisher would select for the launching of a new enterprise. Paper was never so dear, and printing was never so difficult, and yet Benn Brothers Ltd. propose to start another paper. The explanation is that the paper must be started, and further, that it must be started at once. There is not only a field open and a well-defined want to be supplied, but the field will not wait, and the want is urgent. Road transport is the one obsessing, overpowering, paramount problem of the moment. Practically no business firm is entirely free from the auxiliaries associated with it. The development of our trade and industry is contingent upon the development of our transport, and there never was a moment in the whole of our industrial history when greater transport facilities were so much needed.

Transport is commonly supposed to be a matter of railway trains, or motor lorries, or aeroplanes, or horses and carts, or some other form of receptacle upon wheels or wings. It is only since road transport came to be an important factor in the situation and since the number of motor owners has considerably increased that a new conception of the problem has arisen. Railway companies and public carriers generally have for long recognised that the essence of the motor transport problem is the return load. Large firms of motor owners and that great mass of small enterprises which has now sprung up in the form of transport agencies are only just beginning fully to realise the real nature of their difficulty. Until the problem of the return journey is grappled with and solved, every vehicle has to do two miles running in order to give one mile service. This return load question is the first and principal reason for the appearance on January 1st of a new weekly journal to be known as *The Transport World*. Its chief mission in life will be to bring together the owner of the freight and the motor proprietor. In this sense it will be a real and effective freight exchange.

Road transport has assured an added importance in the last few weeks on account of the rapid rise in railway charges. Whereas, a few months ago, the transport of goods by road motor was in many cases something in the nature of an expensive luxury, to-day direct transport by road effects a definite economy as compared with railway service. The steam wagon and the motor lorry are in a position to claim that they can render not only a better but a cheaper service than any other form of transportation, but road transport does not by any means depend alone upon financial advantage in the appeal which it makes to the traders of the country. It can offer a service which is altogether unobtainable through any other field. The first elementary advantage which it claims is, of course, that it can perform its service with one loading and one unloading. It abolishes altogether the troublesome and risky business of cartage to and from the railway depot. Contents by road transport from door to door are handled twice, whereas, if sent by rail, four handlings are at least necessary. All the risks associated with moving and lifting are therefore reduced at a stroke. Road transport can do much more. It eliminates most, if not all, of the necessity for expensive packing; a lorry can be loaded and packed in exactly the same way as a packing-case itself, and when the packing is done, it is not necessary to consider how many times the case will be turned over and all the consequences that might arise from placing it upside down. There is no need to pencil all over the consignment "This side up, with care." Even, therefore, where road transport may show a slightly higher charge than would be incurred upon the rail, it is often more than balanced by economies in crates and

packing materials, and by the elimination of the serious risk of numerous handlings.

But these are details. *The Transport World* really means what its title says. It proposes to take its place as the organ of the transport world, it will give voice to a great organism which exists to-day and is dumb. It will canvass the interests of commercial road users, and act as a focus for their opinions and their needs. It will by no means confine its attention to the professional owners of motor transport, it will seek to serve the hundred thousand manufacturers and other commercial concerns, who, owning their own vans, are the greatest sufferers from this difficulty of the return load. A simple way in which the reader can sketch for himself the gigantic size of this problem and the enormous waste involved in the present lack of a solution to it is to stand for an hour at the junction of two well-used country roads and notice the number of empty lorries which pass.

The Transport World is not in any sense a motor paper, it does not aspire to compete with the Motor Press, as at present established. Motor manufacturing, motor buying, and selling, and the pleasure-motoring world is served by a public and a technical press of the first order. Benn Brothers, Ltd., do not desire to be regarded as in any way competitors of their friends in these fields. There is no industry that has a better press, and there would be no excuse for further efforts in that direction. *Transport World* will occupy a position of its own, and will supplement the service now given to the Motor World proper.

Transport World is not concerned with the buying and selling and manufacturing of lorries and motors so much as with their day by day use. An analogy for our position is to be found in the Shipbuilding and Shipping World. There is a press which deals with the technicalities of shipbuilding and naval architecture, and there are other papers quite distinct which confine their attention to freight and baling and the operation of ships. *Transport World* will aim to be to the users of the road what *Fair Play* or *Syren* and *Shipping* are to the users of the sea.

A great deal has already been done with a view to helping towards a solution of the return load problem. The Automobile Association itself, and many other agencies, large and small, have arranged systems of freight exchange and facilities for securing information as to transport available and freight owners' requirements. *The Transport World* will enable all this work to become really effective; it will act as the great co-ordinating agent. The need which all of these endeavours have only been able to satisfy in part is for a central source of information which will make it possible for anyone anywhere to ascertain instantly what is the transport position on any route, or in any district, at any time. *The Transport World* will, therefore, be welcomed by all those associations and agencies which have started to work in this field, and should be able very materially to enhance their scope and usefulness.

It is, perhaps, unnecessary to add that the new journal starts under the very best of auspices, in that it becomes one of the powerful group of journals which operate under the banner of Benn Brothers, Ltd. It will be planned and conducted on the principles which have always been associated with this firm, and which seem to us to provide the ideal conditions for trade newspaper success. So far as editorial policy and style of production are concerned, *The Transport World* will have no more to do with any of its associated papers than they have with one another. It will, however, enjoy from its first issue the advantages of a publishing organisation designed and conducted upon a scale which would be impossible to any single technical paper. While on its technical side it will be in the hands of acknowledged experts in motor traction problems.

The readers of this Journal who are interested in transportation problems, who either own motors or have the disposal of freight, are invited to communicate with the Publisher, *The Transport World*, 8, Bouvierie-street, London, E.C.4. It is proposed to offer special terms and advantages to the existing customers of Benn Brothers, Ltd., whether advertisers or subscribers, and particulars of these will be gladly sent upon receipt of an intimation that they would be welcomed.

As one of the elder brothers of the same family of journals, we may perhaps be permitted to express our gratification at the arrival of so welcome and so promising a youngster amongst us.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Notice of Intended Dividend

EDGE, JOHN, 18, Spring Gardens, Pendleton, Lancs., carrying on business under the style of John Edge & Co., at Maple Street, Pendleton, drysalter. 3s. 8d. first and final. November 30, 111/117, Corn Exchange Buildings, Manchester.

Companies Winding Up Voluntarily

ELECTRO-CHEMICAL DEVELOPMENTS, LTD.—Liquidator, E. A. Ashcroft, 65, London Wall, London, E.C. 2.

GLACIER ANTIFRICTION METAL CO., LTD. (in voluntary liquidation).—A general meeting will be held at Waldo Road, Willesden Junction, London, N.W. 10, on Monday, December 20, at 12 noon.—S. B. Sanders, Liquidator.

TUNGSTEN & RARE METALS CO., LTD. (in voluntary liquidation).—A general meeting of members will be held at the offices of Messrs. Marreco, Houseman & Brandon, 10, New Court, Carey Street, London, W.C. 2, on Tuesday, December 7, 1920, at 11 a.m.—W. F. Marreco, Liquidator.

Liquidator's Notice

LABORATORY UTILITIES CO., LTD.—A meeting of creditors will be held at the office of the Liquidator, Golden House, Great Pulteney Street, London, W. 1, on Friday, November 12, at 12 noon.—Constance M. Prentice, Liquidator.

Adjudication

The following amended notice is substituted for that published in the London Gazette of October 29, 1920.

BONAVVENTURA, FELICE ADOLFO, and AVELINE, HUGH EDWARD, both residing at 97A, Armitage Mansions, Golders Green Road, Golders Green, and HARRISON, EDWIN, residing at "Hillside," Duddington Lane, Neasden, Middlesex (described in the receiving order as Felice Adolfo Bonaventura, Hugh Edward Aveline and Edward Harrison), trading in co-partnership as Felice Bonaventura & Co., at 24, Great Tower Street, London, E.C., Chemical merchants and importers. High Court of Justice. October 27, 1920.

PUBLISHER'S ANNOUNCEMENT

New "copy" for advertisements must arrive on or before Friday preceding date of publication. Blocks with solid black background are not accepted. Line blocks are preferable to half tones.

All advertisements other than full page size, must be enclosed in a complete rule border.

FOR ALL KNOWN PURPOSES
ACTUAL MANUFACTURERS AND
ALWAYS BRITISH.
CASEIN LTD.
BATTERSEA,
LONDON, S.W.1.

TEAK VATS

Selected, or sample on our approval terms, worth double. Overall sizes, 37 $\frac{1}{2}$ " by 26", £4/10/0 each, with cover, £5 5/0, material 2" thick. Smaller, 20 $\frac{1}{2}$ " by 15 $\frac{1}{2}$ " by 19", £1 2/6 each, with cover £1/7/0 material 1 $\frac{1}{2}$ " thick. Second-hand Huts and Sheds, also New and Second-hand Timber, Plywood, Woodwork of all descriptions.

JENNINGS, Ltd., 889, Pennywell Rd., BRISTOL

Mortgages and Charges

[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.]

BRITISH OIL CRUSHERS, LTD., Brockley, S.E.—Registered October 29, £2,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £1,500; general charge.

YORKSHIRE VARNISH CO., LTD., Ripon.—Registered October 26 (by order on terms), £4,000 debentures; general charge. *Nil. March 19, 1920.

ZINC OXIDE MANUFACTURING CO., LTD., Liverpool.—Registered October 25, £250 debentures, to H. Simm, 16, Osterley Park Road, Southall, engraver, and another; also registered October 25, £500 debentures, to J. W. Bailey, Kersley Mount, Farnworth, Bolton; general charge. *Nil. December 31, 1919.

Bills of Sale

[The undermentioned information is from the Official Registry. It includes Bills of Sale registered under the Act of 1882 and under the Act of 1878. Both kinds require re-registration every five years. Up to the date the information was obtained it was registered as given below; but payment may have been made in some of the cases, although no notice had been entered on the Register.]

BALLABENE, ADOLFO, 6, St. George's Square, Regent's Park, soap manufacturer. Filed November 2. £200. BURFORD, R. A., 303, Bethnal Green Road, Bethnal Green, and BURFORD, E. E., 77, Cheshire Street, Bethnal Green, chemical manufacturers, &c. Filed November 2. £150.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

TRESTRAIL, J. P., Porthleven, chemist. £32 5s. 8d. September 30.

KHYRTMANS, E. C., The Laboratory, Edmonton, chemist. £10 1s. October 5.

SCOTT, J. WILSON, Tyseley, Birmingham, chemist. £14 9s. September 20.

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ENGLISH MAKE. WATER WHITE 98/100%

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Chemical Manufacturers and Merchants.

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WITH its offices in all the principal towns in Greece, in Egypt, Cyprus, Crete, Constantinople, and in Smyrna, the Bank extends Exceptional Facilities for Export and Import Trade between Great Britain and the Near East generally and invites enquiries and correspondence relating thereto.

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Are at present on order for handling over 150,000 tons per day of highly corrosive liquids and acids at varying temperatures. High efficient results in the cost per foot ton in many cases being 0.0015d. reckoning on the basis of electricity at 1d. per unit. The maintenance and depreciation charges are infinitesimal. New devices and improvements eliminate gland trouble.

Three years running of a Ceratherm Pump in a client's works still leaves it in a condition as good as new and the same pump has handled a variety of chemicals daily including hydro-chloric acid and hot oxidising liquids. In many cases Ceratherm Pump have paid for their cost of installation in three or four months.

A large scale works demonstration plant is maintained in our laboratories and every facility for readings and examination of above claims is available to customer.

At the present price of coal and labour the adoption of our pumps and plant warrants particular investigation.

Ceramic Lined Vats for any type of chemical.
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